

REPORT

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MEDICAL SERVICES, MINISTRY OF HEALTH

REPUBLIC OF THE SUDAN

FOR THE YEAR

1961 - 1962

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FOR THE YEAR

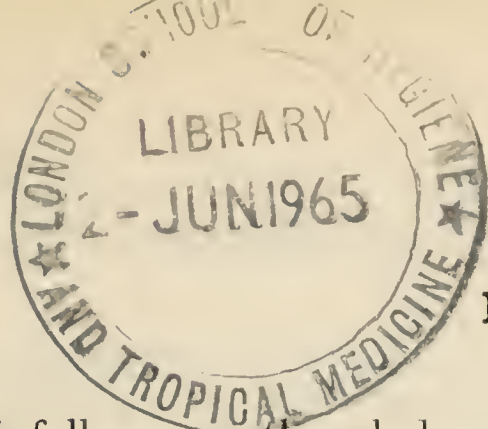
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CHAPTER 1

INTRODUCTION

Rainfall was on the whole good, resulting in plentiful cash crops and crops for human food and animal grazing. No famines occurred excepting mild shortage of Dura with the closing of the year in some parts of Bahr El Ghazal Province, particularly Gogrial and Aweil Districts, where rainfall was below average and quantities of Dura had to be brought from the North and sold to people at basic prices. In some areas of the country there was, with heavy rains, increase of mosquito breeding places and interference with carrying out Gammexane spraying at the proper time.

1961/1962 remains eventful by the birth of the seven year plan (1961/62 to 1967/68) which was subsequently extended, to expire in 1970/71 and by the W.H.O. Inter-Regional Seminar on Training of Auxiliary Personnel, which was held in Khartoum in the month of December, 1961.

No outbreak of Epidemic Diseases occurred apart from a very minor one of relapsing fever in Port Sudan Area.

Sporadic cases of Cerebro-spinal Meningitis were reported from all the Provinces with the heaviest incidence in Darfur, Equatoria and Bahr El Ghazal. Only 8 cases of Small Pox were reported and they were all from the Blue Nile Province. The figure is far below that of the preceding year.

On the endemic diseases side, the total recorded figure for Malaria is higher than in the previous year and that is most likely due to heavier rains and a consequential increase in mosquito breeding.

In the Gezira Irrigated Area, the control of Bilharzia with chemical and mechanical barriers continued.

The incidence of Trypanosomiasis continued to scale down with Lomidine Prophylaxis and there has been a sharp drop in the number of cases compared with last year.

On the curative side 5 hospitals, 12 dispensaries and 19 dressing stations were opened during the year.

NAMRU-3 of the United States Navy Research Unit continued their research work in Kala-Azar at Malakal Area (Upper Nile) as regards Vector-insect, wild and domestic animal reservoir, collection of epidemiological data and diagnostic and clinical observations.

The sample morbidity and follow-up surveys conducted by the Ministry with the help of the World Health Organization, Diarrhoeal Diseases Advisory Team in Khartoum Area ended in April, 1962 after covering representative samples of the population surveyed, of various socio-economic groups (Rural and Urban) during a period of 9 months (for more information please see details in Chapter VIII—Stack Medical Research Laboratories Report.)

Internationally-Assisted Projects

B. C. G. Campaign: In April, 1960 all international assistance (personnel and otherwise) was withdrawn in accordance with agreement and the Ministry of Health, on behalf of the Republic of the Sudan, assumed full responsibility for the Project.

During the year the national staff, adequately equipped, covered 114,663 persons with tuberculin tests of whom 53,929 were vaccinated in the various provincial centres.

T. B. Training Centre : During the year the T.B. Control, Demonstration and Training Centre at Wad Medani, continued its various activities according to the standard method established, and covered 5,578 new attendants (including 1,503 contacts). 7,249 tuberculin tests and 1,706 B.C.G. vaccinations were done. There was a total of 14,897 attendants, 2,007 home visits and 11,547 X-ray filmed.

Nursing College Khartoum : There were 28 girls under training in the 3 classes during the year including 2 Libyan girls admitted at the request of World Health Organization.

5 girls graduated this year.

School of Dental Assistants : A total of 13 students, forming the first batch and admitted to the School last year, pursued their course of training and will graduate next year. Of these 10 were from the Ministry of Health and 3 from the Army Medical Corps, of whom one was a girl who joined in June, 1961.

Malaria Project : With the exception of Darfur, Bahr El Ghazal and Equatoria Provinces where work is in progress, routine surveys were completed in all the other Provinces and epidemiological data collected regarding features of endemicity and epidemicity of Malaria, and vector species distribution chart prepared.

Protective spraying with D.D.T. covered 600,000 Nomads and migrant labourers in an area of 78,044 sq. kms.

In Sennar Malaria Pilot Project, which has become the Government responsibility, spraying campaigns with D.D.T. covered 225,000 population in the 3 Northern Zones while general spraying covered 4 Southern Zones.

El Huda Rural Health Demonstration Project : The project started in November, 1961 with the objective of participating in the planned social and economic development in co-operation with the various ministries concerned.

Its activities envisage provisions of health services, preventive and curative, agriculture and horticulture, veterinary and training of social workers and village craftsmen, etc. It also aims at developing, extending and integrating these services in a model pattern and system of administration for other areas.

Onchocerciasis Control Project : The project started as far back as 1959. During 1961/62 activities were shouldered only by Ministry of Health staff and were mainly directed to treatment for sufferers.

Communicable Eye Diseases Project : Subsequent to the fact-finding survey carried out in January to February, 1961 in the Northern Province, work was limited to recruitment of staff as well as other preparatory procedures.

The Blood Bank : The services of the Bank continued to develop during the year. A total of 2,863 donors have been bled and 2,460 pints of blood issued to the various hospitals in Khartoum area. Steps are in progress to perform Serological and Haematological investigations conducive to diagnosis of rare Blood Diseases.

U.N.I.C.E.F.

This Organization, apart from extending assistance to other projects, has continued to provide assistance to mother and child welfare centres, midwifery, nursing schools (junior) and the School of Hygiene through provision of milk, vitamins, mineral tablets and transport.

Fellowship

The following candidates were awarded Study Courses during the year :—

NAME	Nature of Study	Country
Dr. Mohammed Mahmoud	Surgery F.R.C.S.	U.K.
Dr. Osman Awadalla	„ F.R.C.S.	„
Dr. El Nazir Fadl El Mula	„ F.R.C.S.	„
Dr. Salah Abdel Rahman	Medicine M.R.C.P.	„
Dr. Sayed Ahmed Ibrahim	Diploma of Ophthalmology	„
Dr. Tag El Din Ahmed	„ „ „	„
Dr. Mohd. Ahmed Gabbani	Obstetric and Gynaecology	„
El Sayed Ahmed Osman	Theatre Instruments Repair	„
El Sayed Kamal Abdel Karim	„ „ „	„
Dr. Abdulla Saad	Ear, Nose and Throat	„
Dr. Abdel Rahman Mohd. Ahmed	Surgery F.R.C.S.	„
Dr. Kamal Bushra	„ F.R.C.S.	„
Dr. Mohd. Ahmed Hassan	„ F.R.C.S.	„
Dr. Ahmed Hassan Adam	„ F.R.C.S.	„
El Sayed A/Rahman Ahmed Abu El Gasim	Laboratory Technicology	„
Dr. Abdel Moneim Wasfi	Skin Diseases	„
Sitt Batoul Saad Mursal	Nursing	Lebanon
Sitt Awatif Ahmed Osman	Nursing	U.S.A.
Dr. Mohed. Zaki Mustafa }	Occupational Health	U.A.R.
Sayed Abdel Hamid Ibrahim }		
Dr. Suleiman Basyouni	Hospital Administration	Lebanon, Iran and U.K.
Dr. Mohed. Osman Abdel Nabi	D.P.H.	U.K.
Dr. Mohed. Ibrahim El Imam	D.P.H.	„
Dr. Mohed. El Mardi El Mamoun	D.P.H.	„
Dr. Hassan Hussein	Tuberculosis	Prague
Sayed Mustafa Ibrahim Abdalla	Mental Nursing	Lebanon
Dr. Shakir Musa Mustafa	D.P.H.	New Zealand
Dr. Abdel Rahman Kabbashi	D.P.H.	„
Sayed Ali Tag El Sir)	Junior Malaria Course	U.A.R.
Sayed Timon Lahur)		
Sayed Ahmed Mohd. El Amin)		
Sayed Beshir Awad El Beshir	Vital Statistics	Beirut
Sayed Velerio Nuer Jukiur	Vital Statistics	Beirut

14 delegates from the Ministry of Health have attended the following Conferences or Seminars :—

NAME	Conference or Seminar	Date
Dr. Mowafi Abdel Fatah)	Seminar on Public Health Administration U.S.S.R.	July/Aug., 1961
Dr. Mahgoub Hamza)		
Sayed Hassan Saleh)	11th. Session of the Regional Subcommittee "A" of the Eastern Mediterranean at Lebanon	28 Aug-1 Sept., 1961
Dr. A.O. Abu Shamma		
Sayed Khalafalla Babiker El Bedri	Community Development at Cairo	Dec., 1961
Dr. A. O. Abu Shamma	W.H.O. Executive Board-Geneva	Jan., 1962
Dr. Abdel Razag El Mubarak	Arab Medical Conference at Baghdad	March, 1962
Dr. Ahmed Abdel Magid Idris	Arab Dental Conference at Amman	March, 1962
Sayed Ibrahim Gasim	Egyptian Pharmaceutical Association (Meeting) at Cairo	March, 1962

NAME	Conference or Seminar	Date
Dr. A. O. Abu Shamma	W.H.O. Executive Board-Geneva	May, 1962
Dr. Anis Mohed. Ali El Shami	W.H.O. Travelling Seminar on Undergraduate Medical Education —U.S.S.R.	7-28 April, 1962
Dr. Ibrahim Suleiman)	W.H.O. General Assembly at Geneva	May, 1962
Sayed K.H.B. El Bedri)	Scientific Group Yellow-Fever (W.H.O. Expert Committee) at Geneva	May, 1962
Dr. Mohed. Hamad Satti		

Some 62 visitors from WHO and various other countries visited the Sudan either in connection with the above-mentioned projects or on Fellowships Study Tours.

CHAPTER 11

ADMINISTRATION

(A) STAFF AND FUNCTIONS

Table 1 shows the establishment of classified staff. Some categories of the Professional and technical staff were still under establishment. The Table includes officials serving on secondment with Local Government Authorities.

PERSONNEL :

TABLE 1 :

Statistics of Classified Staff Establishment covering the the period 1.7.1961 to 30.6.1962.

CATEGORY	Establishment	
	Sudanese	Expatriate
HEADQUARTERS :		
Director	1	—
Deputy Director	1	—
Asst. Director (Public Health) and Curator of the Graphic Museum	1	—
Asst. Director (Development and W.H.O. Affairs)	1	—
Asst. Director (Hospitals)	1	—
Chief Tuberculosis Division	1	—
Deputy Asst. Director (Hospital)	1	—
Chief Public Health Inspector	1	—
Senior Establishments Officer	1	—
Inspector of Administration	1	—
Establishments Officer	1	—
Asst. Establishments Officer	1	—
Principal School of Hygiene	1	—
Principal Matron	1	—
Asst. Principal Matron	1	—
Head Staff Clerk	1	—

CATEGORY	Establishment	
	Sudanese	Expatriate
Secretary to Minister of Health	1	—
Staff Clerk	7	—
Senior Clerk	11	—
Clerk (Including T.B.T. Centre)	27	—
Staff Clerk (Statistics)	2	—
Clerk (Statistics)	2	—
Junior Clerk (Including Minister of Health Office)	9	—
FINANCE BRANCH :		
Controller of Accounts	1	—
Inspector of Accounts	1	—
Head Accountant	2	—
Accountant	5	—
Senior Book-keeper	8	—
Draftsman	1	—
Book-keeper	23	—
Junior Book-keeper	3	—
Sarraf	1	—
STORES SECTION :		
Chief Medical Supplies	1	—
Controller, Medical Stores	1	—
Pharmacist	—	1
Asst. Controller, Medical Stores	1	—
Inspector of Drugs	1	—
Supt. of Stores	4	—
Inspector of Instruments	1	—
Stock Verifier	1	—
Senior Store-keeper	6	—
Store-keeper	30	—
Store-keeper Under Training (Northern Hospitals)	10	—
Telephone Operator	1	—
	177	1
HOSPITALS AND DISPENSARIES :		
Senior Physician and Director Khartoum Hospital	1	—
Senior Surgeon	1	—
Senior Obstet. and Gynaecologist	1	—
Senior Ophthalmologist	1	—
Senior Psychiatrist	1	—
Physician	9	—
Diseases Specialist	—	—
Chest Physician	3	—
Cardiological Technician	—	1
Surgeon	5	5
Ear, Nose and Throat Surgeon	—	1
Psychiatrist	1	—
Radiologist	3	—
Anaesthetist	2	—
Registrar in Anaesthesia	2	—
Gynaecologist	10	—
Ophthalmologist	12	1
Registrar	4	—
General Duty Doctor (Including Study Courses)	226	23
Houseman	60	—
Senior Dental Surgeon	1	—
Dental Surgeon	3	4
Dental Officer	3	—
Dental Mechanic	2	2
Dental Mechanic Trainee	1	—
Pharmaceutical Registrar	1	—

CATEGORY	Establishment	
	Sudanese	Expatriate
Pharmacist	2	—
Lay Administrator	1	—
Supt. Radiography	1	—
Clinical Pathologist	1	—
Senior Dispenser	5	—
Dispenser	22	—
Dispenser Under Training	7	—
Senior Radiographer	2	—
Radiographer	30	—
Asst. Radiographer Under Training	8	—
X-Ray Technician	1	—
Hospital Manager	5	—
Dark Room Technician	1	—
Electrical Engineer	—	1
Laboratory Technician	—	3
Senior Medical Assistant	15	—
Medical Assistant	563	—
Mental Health Assistant	2	—
Ophthalmic Assistant	22	—
Refractionist	17	—
Senior Nursing Instructor	2	—
Nursing Instructor	43	—
Theatre Attendant	83	—
Head Mumarrid	69	—
Senior Clerk	10	—
Clerk	32	—
Junior Clerk	20	—
Card Clerk	1	—
Senior Book-keeper	14	—
Book-keeper	22	—
Junior Book-keeper	48	—
Sarraaf	2	—
Senior Store-keeper	1	—
Store-keeper	27	—
Junior Store-keeper	65	—
Store-keeper Under Training	7	—
Telephone Operator	6	—
Quarantine Overseer	2	—
NURSING STAFF :		
Matron Khartoum Hospital	—	1
Matron Omdurman Hospital and N.T. School,	—	1
Hospital Matron (W Medani, Port Sudan, El Fasher, Juba and Atbara)	4	2
Asst. Matron	—	5
Charge Sister	14	—
Physiotherapist	1	5
Nursing Sister	19	13
School Hostess (Nursing College)	1	—
A/Nursing Sister	29	—
Dietician Sister	—	1
Sister Tutor	1	—
Ward Sister	—	16
Staff Midwifery	6	—
	1,587	85
PUBLIC HEALTH :		
Province Medical Officer of Health	11	—
Asst. Province Medical Officer of Health	9	—
Woman Doctor	1	—
Senior Public Health Inspector	15	—
Public Health Inspector	16	—
Port Health Officer	1	—
Public Health Officer	81	—

CATEGORY	Establishment	
	Sudanese	Expatriate
Public Health Officer Under Training	20	—
Principal Midwifery Training School	1	—
Principal Health Visitors Training School	1	—
Asst. Chief Public Health Inspector	1	—
Asst. Principal Health Visitors Training School	1	—
Asst. Principal Midwifery Training School	1	—
Health Visitor	34	—
Senior Staff Midwife	6	—
Staff Midwife	17	—
Asst. Supt. Nursing Officer	2	—
Senior Health Visitor	6	—
Supt. Midwifery Training School	6	—
Supt. Nursing Officer	8	—
Senior Sanitary Overseer	1	—
Sanitary Overseer	31	—
Junior Sanitary Overseer	171	—
Public Health Student Under Training	40	—
Senior Technical Clerk	1	—
Clerk	18	—
Junior Clerk	12	—
Junior Book-keeper	1	—
Staff Clerk	2	—
	515	—
RESEARCH AND LABORATORIES :		
(a) <i>Stack Medical Research :</i>		
Asst. Director Research	1	—
Bacteriologist	2	—
Medical Zoologist	1	—
Pathologist	1	—
Registrar	1	—
Supt. Laboratory	1	—
Laboratory Technician	17	—
Laboratory Technician Trainee	5	—
Senior Laboratory Assistant	14	—
Laboratory Assistant	111	—
Head Laboratory Attendant	2	—
Laboratory Attendant	1	—
Junior Technical Assistant	1	—
Senior Clerk	1	—
Clerk	1	—
Junior Clerk	1	—
(b) <i>Chemical Laboratories (W.C.L.) :</i>		
Government Analyst	1	—
Asst. Government Analyst	3	—
Scientific Officer Under Training	3	—
Chief Pharmaceutical Section	1	—
Senior Technical Assistant	3	—
Pharmaceutical Chemist	1	—
Technical Assistant	7	—
Assistant Scientific Officer Under Training	2	—
Junior Technical Assistant	3	—
Clerk	2	—
Library Clerk	1	—
(c) <i>Medical Entomology :</i>		
Medical Entomologist	—	1
Asst. Scientific Officer Under Training	3	—
Asst. Scientific Officer	1	—
Entomological Technician	1	—

CATEGORY	Establishment	
	Sudanese	Expatriate
Technical Assistant	1	—
Junior Technical Assistant	1	—
Junior Clerk	1	—
(d) <i>Schistosomiasis</i> :		
Biologist	—	1
Senior Technical Assistant	1	—
Technical Assistant	1	—
Clerk	1	—
Store-keeper	1	—
	200	2
GRAPHIC MUSEUM :		
Asst. Curator	1	—
Technical Assistant	1	—
Museum Attendant	1	—
	3	—

SUMMARY OF CLASSIFIED STAFF

CATEGORY	Establishment	
	Sudanese	Expatriate
Headquarters and Stores Section	177	1
Hospitals and Dispensaries	1,587	85
Public Health	515	—
Stack Medical Research	161	—
Chemical Analytical Section	27	—
Medical Entomology	8	1
Schistosomiasis	4	1
Graphic Museum	3	—
GRAND TOTAL	2,482	88

Unclassified staff excluding casual labour numbered 8,347 approximately.

Physicians, etc. Practising in the Sudan

OCCUPATIONS	Government Officials Serving in Min. of Health	Private Practice
Physician (including Chest Physician)	13	—
Surgeon	11	—
Obstet. and Gynaecologist	11	—
Ophthalmologist	14	—
Psychiatrist	2	—
Radiologist	3	—
Anaesthetist	4	—
General Duty Doctor	249	114
Dentist	11	25
Pharmacist	3	57
Dispenser	27	—
Medical Assistant	578	—

(B) LEGISLATION :

The following legislations were enacted during the year :—

(1) THE SLEEPING SICKNESS (AMENDMENT) REGULATIONS, 1961

(1961 L.R.O. No. 14)

These amendments are for the redistribution of powers or otherwise in existing Regulations in order to bring them in harmony with the amendments made in relevant legislation by the Provincial Administration (Consequential Amendments) Act, 1961.

In exercise of the powers conferred upon him by Section 38 of the Public Health Ordinance, the Minister of Health hereby amends the Sleeping Sickness Regulations, 1939 as follows :—

1. These Regulations shall come into force in all Provinces on the appointed day referred to in Section 2 of the Provincial Administration (Consequential Amendments) Act, 1961.

2. The Regulations set out in Column I of the Schedule hereto are amended by the deletion, in every place in which they occur, of the words appearing in Column II, and the substitution therefor of the words appearing in Column III.

THE SCHEDULE

Column I	Column II	Column III
3	Governor	Repealed
8	"	Province Authority
9	"	"
10	"	Province Medical Officer of Health
11(2)	"	" " " "
12(1)	"	" " " "
12(2)	"	" " " "
14(1)	"	Province Authority
15	"	" "

(2) THE PUBLIC HEALTH (YELLOW FEVER) AMENDMENT

REGULATIONS, 1961

(1961 L.R.O. No. 15)

This amendment is for the redistribution of powers or otherwise in existing Regulations in order to bring them in harmony with the amendments made in relevant legislation by the Provincial Administration (Consequential Amendments) Act, 1961.

In exercise of the powers conferred upon him by Section 9 of the Public Health Ordinance, the Minister of Health hereby amends the Public Health (Yellow Fever) Regulations, 1941 as follows:—

1. These Regulations shall come into force in all Provinces on the appointed day referred to in Section 2 of the Provincial Administration (Consequential Amendments) Act, 1961.

2. In Regulation 2 (c) the words “A District Commissioner or Mamur” are repealed and the words “The Official authorised by the Minister of Health or the Director, Ministry of Health” substituted therefor.

(3) THE PUBLIC HEALTH (RELAPSING FEVER AMENDMENT)

REGULATIONS, 1961

(1961 L.R.O. No. 16)

This Amendment is for the redistribution of powers or otherwise in existing Regulations in order to bring them in harmony with the amendments made in relevant legislation by the Provincial Administration (Consequential Amendments) Act, 1961.

In exercise of the powers conferred on him by Section 38 of the Public Health Ordinance, the Minister of Health hereby amends the Public Health (Relapsing Fever Regulations, 1941 as follows:—

1. These Regulations shall come into force in all Provinces on the appointed day referred to in Section 2 of the Provincial Administration (Consequential Amendments) Act, 1961.

2. In Regulation 2 the expression “The District Commissioner on the advice of the Medical Officer of Health” is repealed and the expression “The Medical Officer of Health in consultation with the Local Government Inspector” substituted therefor.

(c) **FINANCE**

TABLE 11 (A)

*Income and Expenditure of the Ministry of Health over the last
4 years*

	1958/59	1959/60	1960/61	1961/62
	LS.	LS.	LS.	LS.
<i>Revenue</i>	82,586	82,137	96,499	106,470
<i>Expenditure</i>				
Personnel	2,036,236	2,134,965	2,253,896	1,878,694
Services	1,785,949	1,849,213	2,155,181	2,154,735
Extra-Ordinary	22,478	31,800	37,223	60,858
TOTAL	3,844,663	4,015,978	4,446,300	4,094,287

TABLE 11 (B)

*Analysis of Expenditure of the Ministry of Health for
1961 / 1962*

SECTION	Personnel	Services	Extra-Ordinary	Total
Headquarters	116,149	694,258	60,858	871,265
Hospitals	1,504,370	1,244,581	—	2,748,951
Hygiene and Public Health	167,142	201,098	—	368,240
Research	88,872	14,798	—	103,670
Graphic Museum	2,161	—	—	2,161
Seconded Staff	—	—	—	—
TOTAL	1,878,694	2,154,735	60,858	4,094,287

REMARKS :- 1961/62 figures are based on actual expenditure.

CHAPTER 111

PUBLIC HEALTH

(a) HEALTH OF OFFICIALS

TABLE 111

NATIONALITY	Number Officials Employed	TOTAL		AVERAGE DAYS SICKNESS	
		Number Placed on Sick List	Number Days Sick	For all Officials	For Those Who Were Sick
Sudanese	17,202	5,680	27,216	1.52	4.79
Non-Sudanese	446	51	415	0.93	8.14

(b) GENERAL HEALTH

EXPANSION OF HOSPITAL SERVICES

The following Hospitals were opened for work during the year :—

	No. of Beds.
Delgo	60
El Borgeig	60
Abu Hamad	60
El Getaina	60
El Huda	20

The building of the following 60 bedded Hospitals were completed during the year. They will operate soon :—

Burram-
El Zeidab.

Hassaheissa, Managil, Yirrol, Kuttum, and Abboud Hospitals are still under construction.

Other buildings that were approved for the year appear in the following list :—

PROVINCE	LOCALITY	BUILDINGS ERECTED
Bahr El Ghazal	Wau	24 bedded ward female.
	Aweil	Store for hospital equipment.

PROVINCE	LOCALITY	BUILDINGS ERECTED
Bahr El Ghazal	Rumbeik	X-ray room.
	"	12 bedded maternity ward.
Equatoria	Juba	8 bedded 2nd ward female
	"	12 bedded maternity ward.
	"	Repairs to ward No. 5 roof.
	"	Repairs to ward No. 6 roof.
	"	Eye clinic.
	"	Administrative block.
	Yei	Store for drugs.
	"	Store for rations.
	"	20 bedded ward.
	Torit	Stores for hospital.
	"	X-ray room.
Blue Nile	Sennar	8 bedded 2nd class ward female.
	"	8 bedded 2nd class ward male.
	"	Out-patient department.
	"	Maternity ward.
	Kosti	Out-patient department.
	Singa	6 bedded 2nd class ward female.
	"	6 bedded 2nd class ward male
	Rufaa	24 bedded T.B. ward.
	Abu Usher	Out-patient department.
	" "	Kitchen block and alterations to the old one into store.
	W Medani	Completion of electricity.
Darfur	Kuttum	Out-patient department.
	"	20 bedded ward female.
	"	Kitchen block.
	"	2nd class ward.
	"	Maternity ward.
	"	Surgery ward.
	"	Conversion of present O.P. to administration block.
	"	Operation block.
	"	Stores for drugs.
	"	Conversion of present male ward to accommodate 20 beds.
	"	Conversion of present female ward.
	Zalingie	Female ward.
	Geneina	Two wards 20 beds each.
	Nyala	2nd class ward female.
	"	2nd class ward male.
	"	X-ray room.
Kassala	Kassala	Administration block.
	Gedaref	Out-patient.
	Aroma	Completion of hospital buildings.
	Port Sudan	Administration block.
	" "	Electricity lift.
	" "	Ward for children double storey.
	Tokar	10 bedded ward female
Khartoum	Khartoum	100 bedded two wards double storey.
	North	
	"	Theatre block.
	"	Drainage system.
	"	Completion of Nervous Disorders Clinic.
	Khartoum	Electroencephalogram unit hospital.
	"	Building of stores for drugs.
	"	Administration block MOH stores.
	"	2nd storey Eye Hospital out-patient.
	"	Cancer Institute.
	Omdurman	Conversion of old kitchen into Phys. block.
	"	Theatre block.
	"	Kitchen block.

PROVINCE	LOCALITY	BUILDINGS ERECTED
Kordofan	Bara	Administration block.
.....	„	Theatre block.
.....	„	20 bedded 3rd class.
.....	„	Kitchen block.
.....	„	Laundry block.
.....	„	Postmortem.
.....	El Dilling	8 bedded 2nd class.
.....	Um Ruaba	8 bedded 2nd class female.
.....	„ „	8 bedded 2nd class male.
.....	„ „	20 bedded 3rd class male.
.....	Talodi	Out-patient department.
Northern	Atbara	12 bedded 2nd class fineale.
.....	„	12 bedded 2nd class male.
.....	„	Drainage system.
Upper Nile.....	Renk	Completion of Renk hospital.
.....	Malakal	2nd class ward female.
.....	Renk	Water supply.

The programme of expansion of dispensary and dressing stations services ncluded the following additions :—

PROVINCE	New Dispensaries	New Dressing Stations
Bahr El Ghazal	—	2
Blue Nile	6	1
Darfur	—	3
Equatoria	—	3
Kassala	—	5
Khartoum	3	2
Kordofan	2	3
Northern	1	—
TOTAL	12	19

TABLE IV
Work done in Hospitals and Dispensaries for 10 years

YEAR	Admissions	Attendances	Operations
1952 53	164,331	13,966,390	26,114
1953 54	172,675	14,483,366	34,432
1954 55	171,092	16,453,892	38,285
1955 56	154,093	17,694,550	38,287
1956 57	176,716	20,430,070	53,839
1957 58	175,543	21,410,339	50,023

1958/59	.....	.....	.....	.....	216,538	24,730,041	64,556
1959/60	.....	.....	.....	.....	185,601	23,999,256	86,771
1960/61	.....	.....	.....	.....	190,962	29,932,923	88,992
1961/62	.....	.....	.....	.....	219,188	28,970,936	109,731

There were 114 licensed private practitioners working independently during the year under review. The figures of their work do not appear in the above list.

ACTIVITIES OF SPECIAL DEPARTMENTS

IN HOSPITALS

Dental Clinics : Work done by these Departments in all provinces during the year is as follows :—

No. of Attendances	..	..	..	..	..	..	159,749
Extractions	..	..	..	..	..	..	60,419
Conservations	..	..	..	..	..	..	4,162
Scaling and Gum Treatment	..	..	..	..	..	..	8,666
Minor Oral Surgical Cases	..	..	..	..	..	..	1,653

X-Ray Treatment - Khartoum :—

Number of X-Ray Films taken for out-patients and in-patients during the year was 24,959.

Physiotherapy Department—Khartoum

Number of attendances during the year was 40,755. Total number of patients was 2,235.

(c) VITAL STATISTICS

Below is the estimated population of the Sudan rendered by the Department of Statistics as on 30th. June, 1962 :—

TABLE V

Approximate Estimation of Population by Provinces

PROVINCE	Men	Women	Children	Total
Bahr El Ghazal	373,000	355,000	528,000	1,256,000
Blue Nile	710,000	679,000	1,123,000	2,512,000

Darfur	432,000	506,000	642,000	1,580,000
Equatoria	318,000	337,000	423,000	1,078,000
Kassala	417,000	312,000	449,000	1,178,000
Khartoum	201,000	158,000	256,000	615,000
Kordofan	625,000	631,000	878,000	2,134,000
Northern.....	249,000	301,000	486,000	1,036,000
Upper Nile	333,000	308,000	439,000	1,080,000
TOTAL	3,658,000	3,587,000	5,224,000	12,469,000

TABLE VI

Population Projection for the Sudan by Sex and Age, 1956—1971
as of 1st January
(In Thousands)

	1956	1961	1966	1971
BOTH SEXES	10,365	11,928	13,733	15,809
MALES				
All ages	5,238	6,029	6,942	7,993
0-4	993	1,154	1,326	1,526
5-9	784	903	1,050	1,206
10-14	662	762	878	1,021
15-19	560	644	741	854
20-24	468	538	619	712
25-29	388	446	513	590
30-34	321	368	423	487
35-39	264	303	347	399
40-44	215	246	283	324
45-49	172	197	226	260
50-54	135	154	176	202
55-59	102	117	133	152
60-64	73	84	96	110
65-69	49	56	64	74
70-74	29	33	38	44
75-79	15	17	19	22
80-84	6	7	8	8
85+	2	2	2	2

FEMALES							
All ages	.....	.....	.....	5,127	5,899	6,791	7,816
0-4	.....	.....	.....	970	1,124	1,292	1,486
5-9	.....	.....	.....	766	883	1,023	1,176
10-14	.....	.....	.....	646	744	857	993
15-19	.....	.....	.....	545	627	722	831
20-24	.....	.....	.....	454	522	601	692
25-29	.....	.....	.....	375	431	496	571
30-34	.....	.....	.....	309	355	408	469
35-39	.....	.....	.....	254	291	334	384
40-44	.....	.....	.....	207	238	273	313
45-49	.....	.....	.....	168	192	221	254
50-54	.....	.....	.....	134	154	175	202
55-59	.....	.....	.....	104	119	137	156
60-64	.....	.....	.....	78	89	102	117
65-69	.....	.....	.....	54	62	71	81
70-74	.....	.....	.....	34	38	44	51
75-79	.....	.....	.....	18	20	23	26
80-84	.....	.....	.....	7	8	9	11
85+	.....	.....	.....	2	2	3	3

TABLE VII

Estimated Population of Khartoum, Khartoum North and Omdurman Towns

Khartoum	..	..	..	..	128,000
Omdurman	..	..	..	..	158,000
Khartoum North	..	..	..	..	55,000
Rural Areas	..	..	..	..	271,000
TOTAL	..	..	..	..	615,000

TABLE VIII

Crude Birth Rate—Khartoum, Khartoum North and Omdurman

TOWN	No. of Registered Births	Crude Birth Rate per 1,000 Persons
Khartoum	5,167	40.3
Khartoum North and Rural Areas	6,491	19.8
Omdurman	5,881	37.1
TOTAL	17,539	28.5

The above figures show births attended and registered by licensed midwives. Births attended by unlicensed midwives are not registered. So the above crude birth rate is not complete.

(d) PREVENTIVE MEDICINE

1. Insect Borne Diseases

- (i) **Malaria** : This disease is one of the major Public Health Problems. Residual adult mosquito control with Gammexane spraying is gradually being expanded in all Provinces. Larval control is being effected in big towns with gardens and Agricultural Schemes.

Following tables give figures for cases and control activities.

MALARIA INCIDENCES

YEAR	BAHR EL GHAZAL			BLUE NILE			DARFUR			EQUATORIA			KASSALA			KHARTOUM			KORDOFAN			NORTHERN			UPPER NILE		
	Cases	D	Mean Rain-fall mm.	Cases	D	Mean Rain-fall mm.	Cases	D	Mean Rain-fall mm.	Cases	D	Mean Rain-fall mm.	Cases	D	Mean Rain-fall mm.	Cases	D	Mean Rain-fall mm.	Cases	D	Mean Rain-fall mm.	Cases	D	Mean Rain-fall mm.	Cases	D	Mean Rain-fall mm.
1957/58 ..	14,762	34	877	79,017	69	426	3,689	8	513	50,782	99	1,238	43,842	23	293	13,701	8	235	91,048	49	528	20,422	5	54	24,993	26	793
1958/59 ..	17,025	44	1,016	96,404	45	432	47,990	19	576	86,458	145	1,409	56,914	28	219	21,078	8	167	144,485	51	416	15,923	3	28	30,136	18	741
1959/60 ..	16,916	36	936	74,150	25	462	41,390	23	538	103,667	77	1,298	74,634	37	321	20,257	10	294	189,548	74	544	16,346	3	80	29,226	29	802
1960/61 ..	31,592	35	1,021	77,620	25	353	67,198	16	548	165,966	107	1,248	57,074	17	224	17,631	3	79	160,908	79	515	14,850	4	214	52,472	50	806
1961/62 ..	28,140	54	1,094	100,356	41	469	89,847	27	584	24,673	131	1,667	87,533	35	298	31,098	8	239	141,838	93	507	14,875	9	50	43,127	21	927

SPACIES OF PARASITES IN 11,646 POSITIVE SLIDES

PROVINCE						<i>P. Falciparum</i>	<i>P. Vivax</i>	<i>P. Malaria</i>
Bahr El Ghazal ..	..	..	..	..	..	560	5	—
Blue Nile ..	..	..	..	..	..	1,686	53	10
Darfur ..	..	..	..	..	..	562	118	30
Equatoria ..	..	..	..	..	..	2,318	—	—
Kassala ..	..	..	..	..	..	914	104	—
Khartoum ..	..	..	..	..	..	715	246	—
Kordofan ..	..	..	..	..	..	3,314	77	—
Northern ..	..	..	..	..	..	309	42	—
Upper Nile ..	..	..	..	..	..	538	42	3
TOTAL ..	..	..	..	..	..	10,916	687	43

SPRAYING ACTIVITY IN THE WHOLE COUNTRY

PROVINCE			Provisional Census	No. of Population Protected	No. of Rooms etc. Sprayed	Amount of Insecticides Used LB.
Bahr El Ghazal ..	..	..	1,256,000	34,428	18,676	13,008
Blue Nile ..	..	..	2,512,000	1,516,000	753,395	155,722
Darfur ..	..	..	1,580,000	220,841	148,602	137,546
Equatoria ..	..	..	1,078,000	119,848	83,489	13,830
Kassala ..	..	..	1,178,000	87,275	19,218	55,174
Khartoum ..	..	..	615,000	636,871	201,394	26,135
Kordofan ..	..	..	2,134,000	543,374	269,159	81,365
Northern ..	..	..	1,036,000	731,584	474,663	131,176
Upper Nile ..	..	..	1,080,000	81,936	47,822	16,478
TOTAL ..	..	..	12,469,000	3,972,157	2,016,418	630,434

SUMMARY REPORT ON MALARIA ACTIVITIES

DURING 1961/1962

MALARIA PRE-ERADICATION SURVEY

Routine surveys were completed in all Provinces except Darfur, Bahr El Ghazal and Equatoria, where work is in course. Epidemiological findings revealed in the 3 Northernmost Provinces hypo-endemicity of malaria with some mesoendemic spots. The areas between 10° N and 14° N shows rather mesoendemic features, with many post-epidemically hyperendemic spots, this region also being most exposed to malaria epidemics. South of 10° N malaria is holo- and hyperendemic and stable with very little seasonal and year-to-year variation. Regarding malaria parasite species distribution major revisions have resulted which have important bearing on planning of future operations.

The entomological unit developed an anopheline species distribution chart, incorporating many new findings especially in Western Sudan. In Upper Nile Province *A. funestus* was beside *A. gambiae* incriminated as a malaria vector. Wherever tests were undertaken, *A. gambiae* was found to be fully susceptible to the standard insecticides.

The technical unit nears completion of the routine surveys. The village and nomad malaria questionnaire action, carried out by the Public Health staff of the Sudan, has already covered half of the country.

MALARIA PILOT PROJECT

In 1961 general spraying and special campaigns for nomads and migrant labourers were performed with D.D.T. protecting almost 600,000 population in an area of 78,044 square-kilometres. Surveillance in the 3 Northern zones has covered 225,000 population. In zones A and B malaria transmission index, as measured in 2,500 infants, was at a total of 0.24 per cent for the whole season. These cases were located in the western margin of the project in the nomad infiltration zones.

General spraying in 1962 covers the 4 Southern zones, whereas the 2 Northern zones were provisionally shifted into the consideration phase, under maintenance of the essential safeguards.

- (ii) **Blackwater Fever** : 2 cases were reported this year compared with 3 cases last year.
- (iii) **Relapsing Fever** : 7 cases were reported from Port Sudan and Tokar as compared with 22 cases last year. six of these cases were discovered in Tokar Area.

A mass delousing campaign was launched throughout the affected areas and police were posted along the border to direct all newcomers from suspected and infected areas to the delousing centres. In addition two search parties were sent through these areas where everyone was examined and dusted.

TABLE IX
Relapsing Fever, Cases and Deaths over the Last Ten Years

YEAR	Cases	Deaths
1952/53	97	14
1953/54	91	8
1954/55	3	1
1955/56	1	—
1956/57	4	—
1957/58	2	—
1958/59	—	—
1959/60	6	—
1960/61	22	—
1961/62	7	1

(iv) **Leishmaniasis** : 4,693 cases were reported this year as compared with 5,077 cases last year. Most of the cases, as in previous years, were reported from Upper Nile and Blue Nile Provinces.

TABLE X
Leishmaniasis Province Distribution 1961/62

PROVINCE	Cases	Deaths
Bahr El Ghazal	—	—
Blue Nile	1,533	46
Darfur	15	—
Equatoria	132	8
Kassala	555	54
Khartoum	73	4
Kordofan	157	2
Northern	—	—
Upper Nile	2,228	34
TOTAL	4,693	148

TABLE XI
Leishmaniasis Recorded Incidence in Ten Years

YEAR	No. of Cases
1952/53	613
1953/54	895
1954/55	1,106
1955/56	1,889
1956/57	7,463
1957/58	3,939
1958/59	8,414
1959/60	4,017
1960/61	5,077
1961/62	4,693

(v) *Trypanosomiasis* : New cases detected were 86 with 3 deaths. In 1960/1961 cases reported were 280 with no death.

The disease is endemic in the western districts of Equatoria Province. Regular sleeping sickness inspection is carried out in all endemic areas for case finding. Chemoprophylaxis is being conducted in Yambio and Yei Districts.

Following table shows the distribution of cases for 10 years in Equatoria Province :—

TABLE XII
Trypanosomiasis : Distribution of cases in Equatoria in Ten Years

YEARS	Yubu	Yambio	Yei	Kajo-Kaji	Meridi	Imported	Other Localities	Total
1952/53	2	53	13	—	—	—	—	68
1953/54	12	148	44	—	—	—	—	204
1954/55	—	467	92	—	1	1	—	561
1955/56	2	210	98	—	—	—	—	310
1956/57	18	871	74	2	4	2	—	971
1957/58	34	37	88	—	—	—	—	159
1958/59	8	37	118	—	4	—	2	169
1959/60	24	—	223	—	—	—	15	262
1960/61	19	1	258	—	—	—	2	280
1961/62	13	—	65	—	—	—	3	81

(vi) *Filariasis*. 2,984 cases were microscopically diagnosed during the year out of which 2,797 cases were reported from Equatoria Province.

2. EPIDEMIC AND ENDEMIC DISEASES

(i) *Yellow Fever*. No case of Yellow Fever was reported this year.

Hearing of the news of an outbreak of Yellow Fever in Ethiopia in February, 1962, a number of 236,525 persons was inoculated in Akobo, El Nasir, Pibor, Maaban and Malakal Area.

(ii) *Anthrax*. 138 cases with 1 death were reported out of which 83 cases were from Kassala Province.

(iii) *Cerebrospinal Meningitis*. 5,902 cases with 431 deaths were reported during the year.

It is believed that cases might have leaked from neighbouring Tchad countries in which a big epidemic occurred this year.

TABLE XIII

*Cerebrospinal Meningitis Recorded Incidence
and Fatality By Provinces during 1961/62*

PROVINCE	Cases	Deaths	Fatality Rates
Bahr El Ghazal	267	36	13.5
Blue Nile	324	31	9.6
Darfur	2,095	132	6.3
Equatoria	1,329	83	6.2
Kassala	33	13	39.4
Khartoum	635	24	3.8
Kordofan	1,081	104	9.6
Northern	21	3	14.3
Upper Nile	117	5	4.3
TOTAL	5,902	431	7.3

TABLE XIV

*Cerebrospinal Meningitis Recorded Incidence
and Fatality in Last Ten Years*

YEAR	Recorded Cases	Recorded Deaths	Fatality
1952/53	2,938	644	21.9
1953/54	88,942	827	9.2
1954/55	3,470	492	14.2
1955/56	9,028	828	9.2
1956/57	5,888	578	9.8
1957/58	2,008	178	8.9
1958/59	1,179	208	17.6
1959/60	1,459	181	12.4
1960/61	7,837	461	5.9
1961/62	5,902	431	7.3

(iv) *Diphtheria*. 1,078 cases with 83 deaths were reported this year as compared with 691 cases and 48 deaths last year.

TABLE XV

*Diphtheria : Recorded Incidence and
Fatality by Provinces—1961/1962*

PROVINCE	Cases	Deaths	Fatality Rate
Bahr El Ghazal	7	1	14.3
Blue Nile	218	20	9.2
Darfur	8	—	—
Equatoria	11	3	27.3
Kassala	105	12	11.4
Khartoum	319	10	3.1
Kordofan	98	16	16.3
Northern	306	19	6.2
Upper Nile	6	2	33.3
TOTAL	1,078	83	7.7

TABLE XVI

*Diphtheria : Recorded Incidence
and Fatality in Ten Years*

YEAR	Cases	Deaths	Fatality Rate
1952/53	717	37	5.2
1953/54	335	27	8.1
1954/55	369	61	16.5
1955/56	356	38	10.7
1956/57	1,497	52	3.5
1957/58	506	38	7.5
1958/59	859	52	6.1
1959/60	940	91	10.3
1960/61	691	48	6.9
1961/62	1,078	83	7.7

(v) *Dysentery*. 5,980 cases were treated in Hospitals as in-patients and 222,979 as out-patients.

(vi) *Enteric Fever*. 1,171 cases with 52 deaths were reported during the year.

TABLE XVII
Enteric Fever : Province Distribution 1961/62

Province	Cases	Deaths
Bahr El Ghazal	—	—
Blue Nile	445	26
Darfur	2	—
Equatoria	10	1
Kassala	69	3
Khartoum	438	11
Kordofan	16	5
Northern	152	4
Upper Nile	39	2
TOTAL	1,171	52

TABLE XVIII
Enteric Fever : Recorded Incidence in Ten Years

YEAR	Recorded Cases	Deaths
1952/53	598	63
1953/54	560	42
1954/55	548	34
1955/56	449	23
1956/57	410	31
1957/58	361	32
1958/59	687	19
1959/60	763	35
1960/61	578	14
1961/62	1,171	52

(vii) *Gastro-Enteritis of Children*. Records of Hospitals and Dispensaries registered 266,292 cases of which 7,284 required Hospitalization with 643 deaths and with a fatality rate of 8.8 per cent of the total admissions.

(viii) *Leprosy*. During the year 839 new cases were diagnosed as bacteriologically positive of which 759 cases were distributed between Bahr El Ghazal and Equatoria Provinces.

(ix) *Poliomyelitis*. 244 cases were recorded this year of which 212 received hospital treatment and 9 deaths were reported. Last year 119 cases with no deaths were reported.

(x) *Hydrophobia*. 15 cases of human rabies were admitted to Hospitals this year.

(xi) *Small Pox*. The total number of cases reported was 8 with no death compared with 162 cases with no death last year. All of the eight cases were reported from Blue Nile Province.

Province distribution of Small Pox vaccinations done during the year was as follows :—

Bahr El Ghazal	..	..	..	..	..	7,991
Blue Nile	..	..	..	..	..	160,567
Darfur	..	..	..	..	..	645,743
Equatoria	..	..	..	..	..	18,717
Kassala	..	..	..	..	..	21,544
Khartoum	..	..	..	..	..	1,056,958
Kordofan	..	..	..	..	..	1,500,435
Northern	..	..	..	..	..	3,035
Upper Nile	..	..	..	..	..	3,549
TOTAL						3,418,539

TABLE XIX
*Incidence of Small Pox and Vaccinations
Performed in the Last Ten Years*

YEAR	Cases	Vaccinations Performed
1952/53	3,670	1,008,581
1953/54	3,030	1,500,000
1954/55	4,200	1,203,673
1955/56	1,427	1,748,190
1956/57	25	648,501
1957/58	295	2,678,223
1958/59	380	2,440,084
1959/60	316	633,275
1960/61	162	1,830,156
1961/62	8	3,418,539

(xii) *Influenza*. 82,347 cases with 19 deaths were reported during the year compared with 72,025 cases with 36 deaths last year.

(xiii) *Tuberculosis*. Routine testing and vaccination have been going on in the various provincial B.C.G. Centres, amongst the public in general and in organized groups particularly school children. All Province Medical Officers of Health have been advised to adopt testing and vaccination of school children as an established routine. Ten new vaccination trainees were appointed for the provincial centres and the Province Medical Officers were advised to train them in general tuberculosis nursing wherever time allows and utilize them in establishing separate tuberculosis registers.

During the year the following tests and vaccinations were performed in the various B.C.G. Centres. Percentages of positive reactors and returns are also shown

TABLE XX

*Tuberculosis : Province Distribution of Admissions
to Hospitals 1961/1962*

PROVINCE	Pulmonary	Non-Pulmonary	TOTAL
Bahr El Ghazal	292	116	408
Blue Nile	898	231	1,129
Darfur	226	39	265
Equatoria	274	69	343
Kassala	615	295	910
Khartoum	995	185	1,180
Kordofan	376	141	517
Northern	293	54	347
Upper Nile	492	50	542
TOTAL	4,461	1,180	5,641

NOTE :—

Figures for Pulmonary Tuberculosis in Khartoum Province include cases coming from the other Provinces to the capital for specialist advice.

TABLE XXI

Tuberculosis : Admissions to Hospitals in Ten Years

YEAR	Pulmonary	Non-Pulmonary	TOTAL
1952/53	1,679	671	2,350
1953/54	2,075	798	2,873
1954/55	2,868	915	3,783
1955/56	2,697	823	3,520
1956/57	3,175	1,005	4,180
1957/58	3,749	1,061	4,810
1958/59	3,864	1,135	4,999
1959/60	4,263	1,297	5,560
1960/61	4,402	1,310	5,712
1961/62	4,461	1,180	5,641

TABLE XXII

*Tuberculosis: Age Distribution of 5,233 of the Cases
Admitted to Hospital 1961/62. No. of Persons and Percentages*

		AGE GROUP IN YEARS								UNDE- FINED	TOTAL
TUBERCULOSIS	.. ..	0-1	2-5	6-15	16-25	26-35	36-45	46-65	OVER 65		
CASES PULMONARY	..	8	43	133	674	1453	1015	566	174	17	4,083
PERCENTAGE	.. ..	0.2	1.1	3.3	16.5	35.6	24.9	13.8	4.2	0.4	100
CASES NON-PULMONARY	..	12	39	167	236	277	262	107	33	17	1,150
PERCENTAGE	.. ..	1.0	3.4	14.5	20.5	24.1	22.8	9.3	2.9	1.5	100

TABLE XXIII

Tuberculosis : Site of Main Lesion in 1,135 of the Non-Pulmonary Cases Admitted to Hospital 1961/1962

SITE OF MAIN LESION	Cases	Percentage
Gland	393	34.6
Bone	346	30.5
Joint	159	14.1
Abdominal	137	12.1
Skin	40	3.5
Genito-Urinary	38	3.3
Meningeal	22	1.9
TOTAL	1,135	100.0

TABLE XXIV

Tuberculosis : 1961/62 Province Distribution of all Cases Diagnosed

PROVINCE	Pulmonary	Non-Pulmonary	TOTAL
Bahr El Ghazal	740	318	1,058
Blue Nile	1,086	1,307	2,393
Darfur	304	76	380
Equatoria	441	172	613
Kassala	1,252	1,187	2,439
Khartoum	1,660	686	2,346
Kordofan	891	476	1,367
Northern.....	652	242	894
Upper Nile	1,742	829	2,571
TOTAL	8,768	5,293	14,061

3. HELMENTHIC DISEASES

(i) *Ankylostomiasis*. 12,913 cases were recorded ; of these 12,011 were reported from the Southern Provinces.

(ii) *Dracontiasis*. 4,444 cases were treated during the year, of these 3,129 were reported from the Southern Provinces.

(iii) *Bilharzia (Schistosomiasis)*. 57,218 cases were recorded during the year. The Snail Control continued on the same lines as before *i.e.* Mechanical trapping, chemical traps and regular inspections of canals in search of snails. About 360 tons of copper sulphate were used for the continuous application for the chemical barriers. 140 tons were used for massive sulphation of the different snail infestation detected.

TABLE XXV

Bilharzia in Gezira Irrigated Area 1957/1958 to 1961/1962

Y E A R	H A E M A T O B I U M						M A N S O N I					
	C H I L D R E N			A D U L T S			C H I L D R E N			A D U L T S		
	Ex- amined	Found	Infected	Ex- amined	Found	Infected	Ex- amined	Found	Infected	Ex- amined	Found	Infected
	No.	No.	%	No.	No.	%	No.	No.	%	No.	No.	%
1957/1958	36,133	1,057	2.9	56,961	961	1.7	36,133	1,859	5.1	56,961	3,873	6.8
1958/1959	40,260	912	2.3	48,245	823	1.7	40,260	1,807	4.5	48,245	2,500	5.2
1959/1960	61,314	1,306	2.1	84,678	1,459	1.7	61,314	2,892	4.7	84,678	4,209	5.0
1960/1961	69,589	956	1.4	97,798	1,190	1.2	69,589	3,201	4.6	97,798	4,583	4.7
1961/1962	69,497	1,035	1.4	110,177	1,330	1.2	69,497	2,942	4.2	110,177	5,035	4.6

TABLE XXVI

Bilharzia : Province Distribution 1961/62

PROVINCE	Cases	Deaths
Bahr El Ghazal	529	2
Blue Nile	16,716	14
Darfur	12,822	1
Equatoria	4,529	6
Kassala	407	1
Khartoum	8,205	4
Kordofan	8,494	1
Northern	5,330	—
Upper Nile	186	—
TOTAL	57,218	29

TABLE XXVII

Bilharzia : Incidence in the Last Ten Years

YEAR	Cases
1952/1953	29,286
1953/1954	30,725
1954/1955	37,570
1955/1956	31,741
1956/1957	43,863
1957/1958	41,645
1958/1959	45,094
1959/1960	47,345
1960/1961	52,877
1961/1962	57,218

(e) SANITARY CIRCUMSTANCES**WATER SUPPLIES**

Improvement of town and rural water supply continues. Controlled water yards and protected haffirs and deep bore wells for rural and nomadic areas are expanding.

REFUSE DISPOSAL

Mainly in towns, this is being carried out by orthodox methods of daily collection, dumping, and burning.

SEWAGE DISPOSAL

The sewage works in Khartoum Town are gradually replacing the bucket system. It has not yet covered the whole town. In Khartoum North the positive steps for the implementation of the proposed sewage system are being taken and progressing steadily.

In other towns bucket system, aqua privy, septic tank and pit latrine are in use.

HOUSING AND TOWN PLANNING

The usual measures to ensure good housing and avoid overcrowding and insanitary conditions are being taken by the authorities concerned in re-planning town expansion and new layouts.

CHAPTER IV
SOCIAL HYGIENE

Midwifery : The following table shows the midwifery training schools, date of foundation of each school, total number of midwives trained and number under training 1961/1962 :—

TABLE XXVIII
Midwifery Training Schools

SCHOOL	Date of Opening	Total Midwives Trained Since Opening	No. of Midwives Under Training During 1961/62
Omdurman	1920	1,011	44
El Obeid	1948	120	14
Juba	1950	53	11
Malakal	1952	48	5
Wad Medani	1953	116	21
Atbara	1955	79	14
Kassala	1957	25	9
El Fasher	1958	18	10
TOTAL		1,470	123

TABLE XXIX
Distribution of Licensed Midwives in the Sudan

PROVINCE	District Midwives	Certifica- ted Nurse Midwives	Staff Mid- wives	Staff Nurses	Health Visitors	Uncertificated Nurse Midwives	Total
Bahr El Ghazal	15	—	—	—	—	2	17
Blue Nile	215	20	4	6	10	10	265
Darfur	52	8	2	4	2	1	69
Equatoria	8	2	1	2	1	32	46
Kassala	51	12	3	5	5	1	77
Khartoum	169	61	4	26	10	—	270
Kordofan	146	19	4	5	2	3	179
Northern	190	20	3	3	4	4	224
Upper Nile	41	—	1	2	1	2	47
TOTAL	887	142	22	53	35	55	1,194

TABLE XXX
New Midwifery Certificates Issued during 1961/1962

PROVINCE	Certificated Nurse Midwives	Village Midwives	TOTAL
Bahr El Ghazal	—	—	—
Bule Nile	2	17	19
Darfur	4	8	12
Equatoria	—	9	9
Kassala	5	8	13
Khartoum	15	14	29
Kordofan	3	16	19
Northern	6	14	20
Upper Nile	—	5	5
TOTAL	35	91	126

Health Visitors School—Omdurman

The school was first opened during November, 1959.

The course is one Academic year.

The candidate must possess elementary school certificate, Nursing Certificate Midwifery Certificate and Staff Midwife Certificate before joining the School.

Total number of Health Visitor graduates from school till now is 35.

There are 10 students in the school at present.

Maternal and Child Health

Improvement and expansion in this important service continued. Five new Maternity and Child Welfare Centres were opened during the year and training of staff maintained.

UNICEF is assisting in this service by provision of necessary equipment and books for training and supply of milk and vitamins for use in the Centres. All Centres were assisted in this manner during the year.

List below shows localities where Centres are operating :—

HEALTH CENTRES

Khartoum Province

1. Khartoum
2. Goz
3. Khartoum North
4. Hay El Arab
5. Wad Nubawi
6. El Fitteihab
7. Kober
8. Halfyat El Mulouk
9. Maigoma
10. Mogren

11. Tuti
12. Higra
13. Banat
14. Burri
15. Shambat
- Blue Nile Province**
16. Wad Medani (a)
17. Dueim
18. Hassaheis
19. Kosti
20. Singa

Blue Nile Province (Cont.)

- 21. El Hosh
- 22. Er Roseires
- 23. Wad Medani (Police)
- 24. Wad Medani (b)

Darfur Province

- 25. El Fasher
- 26. El Geneina

Equatoria Province

- 27. Juba

Kassala Province

- 28. Kassala
- 29. Port Sudan (East)
- 30. Port Sudan (West)

- 31. Deim Shatti (Port Sudan)
- 32. Deim Arab (Port Sudan)
- 33. Aroma
- 34. Tokar

Kordofan Province

- 35. El Obeid
- 36. El Nahud
- 37. Fellata (El Obeid)

Northern Province

- 38. Atbara
- 39. Damer
- 40. Shendi

Upper Nile Province

- 41. Malakal

The following are ante-natal clinics where, due to shortage of Health Visitors and other trained staff, only ante-natal work is carried out :—

Wau	Li Rangu	Dongola
Kwojok	Yei	Wadi Halfa
Rumbek	Maridi	Abri
Aweil	Kapoeta	El Dakhla
Tonj	Sinkat	Darmali
Sennar	Gedaref	Fangok
Bakht El Ruda	Abu Deleig	Bentui
Abu Usher	Um Ruaba	Bor
Rufaa	Kadugli	Renk
Kurmuk	Talodi	Nasir
Tendelti	Heiban	
Nyala	Abu Gebeiha	
Zalingei	Rigl El Fula	
Lui	Dilling	
Mondri	Bara	
Torit	Berber	
Sources Yubu	Merowe	

TABLE XXXI

*Activities of Maternity and Child Welfare Centres and Ante-Natal
Clinics throughout the Sudan for the Year 1961/1962*

PROVINCE	No. of Clinics M.C.W. and Ante-Natal	Ante-Natal Attendance in all Clinics	No. of Home Visits	No. of Health Centres	Child Attendances M.C.W. Centres	No. of Deli- veries by Trained Mid- wives
Bahr El Ghazal	5	6,242	—	—	—	126
Blue Nile	15	50,886	3,176	9	44,779	1,466
Darfur	4	7,455	1,001	2	11,097	194
Equatoria	9	7,018	422	1	6,189	—
Kassala	9	29,095	1,625	7	16,505	2,969
Khartoum	16	78,430	5,870	15	7,726	16,554
Kordofan	11	10,386	842	3	6,849	350
Northern	10	22,618	1,227	3	11,018	1,142
Upper Nile	6	8,005	424	1	6,910	548
TOTAL	85	220,135	14,587	41	111,073	23,349

MEDICAL EXAMINATION OF SCHOOL CHILDREN

School Medical Service

The following Table summarises the result of Medical Examination of School Children in the Provinces :—

TABLE XXXII

Medical Examination of School Children

PROVINCE	No. of Children Examined	NUMBER OF CASES FOUND					
		Trachoma	Bilharzia	Enlar- ged Spleen	Pulmo- nary T.B.	Ancylo- stoma	All Other Diseases
Bahr El Ghazal	1,335	7	5	119	—	34	78
Blue Nile	36,619	2,363	627	721	—	15	166
Darfur	6,455	884	782	915	—	127	—
Equatoria	12,315	669	422	1,660	—	1,127	—
Kassala	18,827	2,045	54	156	2	—	—
Khartoum	18,374	1,272	10	29	—	—	—
Kordofan	9,057	452	677	461	—	20	974
Northern	31,798	9,653	1,427	208	—	155	2,885
Upper Nile	3,090	178	7	220	—	2	40
TOTAL	137,870	17,523	4,011	4,489	2	1,480	4,143
Percentage	100.0	12.7	2.9	3.3	—	1.1	3.3

Mental Health

18,741 cases were seen during the year by the Psychiatrist at the Clinic for Nervous Disorders, Khartoum North ; 10,336 were interviews for males and 8,405 interviews for females. 2,905 were new patients, the balance representing the return attendances.

The number of medico-legal cases interviewed at Kober Institution is 617.

The Mental Diseases Board saw 49 cases during the year. The findings of the Board were as follows :—

- 8 cases fit for Government Service.
- 17 cases unfit for Government Service.
- 24 cases fit for temporary service or referred for treatment and to re-appear before the Board at specified dates.

TABLE XXXIII

Categories of Diseases in 18,811 Mental Cases

MONTH	Sch. 120 Phrenic Reaction	Manic	Depres- sion	Manic/ Depressive Psychosis	Anxiety Reaction	Hysteria	Epilepsy	Headache	Psychoso- matic Disorders	Dis. Groups	Total
June/July, 1961 ..	176	61	123	44	305	44	108	57	146	366	1,430
July/August, 1961 ..	187	69	129	51	333	48	121	61	157	507	1,663
August/Sept. 1961 ..	207	72	127	66	348	47	131	66	162	393	1,619
Sept/October, 1961..	362	88	183	74	351	54	156	77	180	604	2,129
Oct./Nov. 1961 ..	221	81	133	75	346	60	139	68	172	315	1,610
Nov./Dec. 1961 ..	195	63	138	72	321	45	126	60	157	372	1,549
Dec./Jan. 1962 ..	189	83	139	71	325	48	135	68	167	206	1,431
Jan. Feb. 1962 ..	174	74	128	70	319	53	133	62	168	231	1,412
Feb./March 1962 ..	161	64	130	51	313	50	116	60	141	149	1,235
March/April 1962 ..	222	87	142	79	355	64	141	73	181	269	1,613
April/May, 1962 ..	188	96	138	77	332	47	140	65	173	217	1,473
May/June, 62 ..	190	75	131	58	131	58	341	52	129	482	1,647
TOTAL ..	2,472	913	1,641	788	3,779	618	1,787	769	1,933	4,111	18,811

Health Education

The weekly radio talks and Health Exhibitions during tribal gatherings and agricultural shows, and press articles remained to be the media and methods for Health Education.

The audio visual aid unit in Khartoum continued its activities and is attempting to produce local films, film strips, photos, posters and models on the local health problems of the country.

CHAPTER V

PORT HEALTH QUARANTINE

Sea and airports remained clear of infection during the season.

Disinfection of aircraft and quarantine control of air travellers were undertaken at Wadi Halfa, Port Sudan, Kassala, Khartoum, Juba, Malakal, Geneina, El Fasher and El Obeid.

The Aedic Index was calculated on an inspection of all habitations within the area concerned. The following table shows the Aedic Index throughout the year at the local airports on the international routes :—

TABLE XXXIV

Aedes Aegypti Index 1961/1962

MONTH		El Fasher	Juba	Kassala	Port Sudan	Khartoum	El Obeid	Wadi Halfa	Malakal
July ..	..	0	0.08	0	0	0	0.29	0	0
August ..	..	0	0.2	0	0	0	0.4	0	0
September ..	..	0	0	0	0	0	0.3	0	0
October ..	..	0	0	0	0	0	0	0	0
November ..	..	0	0	0	0	0	0	0	0
December ..	..	0	0	0	0	0	0	0	0
January ..	..	0	0	0	0	0	0	0	0
February ..	..	0	0	0	0	0	0	0	0
March ..	..	0	0	0	0	0	0	0	0
April ..	..	0	0	0	0	0	0	0	0
May ..	..	0	0	0	0	0	0	0	0
June ..	..	0	0	0	0	0	0	0	0

Port Sudan Quarantine

Total ships inspected were 1,230 of which 504 were given radio pratique.

Suakin Quarantine

6,874 Sudanese pilgrims left for Jeddah this year ; 4,713 of whom left by air from Port Sudan and 2,161 left by sea from Suakin.

In previous Annual Reports the number of pilgrims recorded therein included Sudanese pilgrims as well as other pilgrims from neighbouring countries who passed through the Sudan on their way to Saudi Arabia.

All out-going pilgrims were compulsorily immunised against Cholera, Small-Pox and Yellow Fever.

The Pilgrimage was declared by Saudi Arabia Kingdom as free from epidemic and quarantinable diseases.

Khartoum North Pilgrims Transit Camp

1,598 pilgrims passed through the camp during the period 1.2.1962 to 30.6.1962 and received the necessary inoculations against Cholera and Yellow Fever and were vaccinated against Small-Pox before their departure.

Medical Mission to the Hedjaz

The Medical Mission consisted of two Doctors, three Medical Assistants, one Store-Keeper, 11 Nurses and Midwives and two other auxiliary staff.

Treatment centres were established at Jeddah, Mecca, Medina, Muna and Arafat. Medical care and attention were given to all pilgrims and local inhabitants who sought them. 20,599 patients were attended to and 21 were admitted to hospital.

Wadi Halfa Quarantine

Examination of labourers coming from United Arab Republic was carried out before entry into the Sudan. 226 river vessels and 300 aircraft were inspected during the year. 16,069 vaccinations against Small-Pox were done in the quarantine. The total number of persons who passed through Wadi Halfa Quarantine was 39,236.

Geneina Quarantine

21,639 persons passed through Geneina Quarantine. 6,154 vaccinations against Small-Pox were done in quarantine.

CHAPTER VI

MEDICAL TRAINING

School of Hygiene

20 students were under training in the First Class.

Basic education requirement for entry into the school is completion of Secondary Education. The students take a three years' course at the end of which they must pass the Royal Society of Health Examination.

In their first year of study the students are given General Science, Building Science, Drawing and Construction Technicology, Levelling and Geometry in the Khartoum Technical Institute.

During the school vacation, the students receive further practical rural tuition in the provinces.

Medical Assistants' Training School

31 Medical Assistants graduated from the school in March, 1962.

A new batch of 38 students was accepted in the school.

Training of Nurses

42 hospitals are now recognized as local Training Centres for hospital nurses.

420 nurses sat for the Nursing Examination this year. 344 successfully passed the Examination ; of these 250 were males and 94 were females.

Laboratory Technicians and Assistants

Two Technician Trainees completed their studies and were absorbed in the Technician Cadre. One technician was permanently seconded to the Ministry of Education.

Four more technician trainees were recruited from the Secondary School and have started their studies. One technician has been sent to the United Kingdom to gain further experience in Laboratory work.

38 Laboratory Assistants were trained during this year. Ten of them were employed by the Army Medical Corps to fill new posts, three of them came from the Republic of Somalia sponsored by the World Health Organization and the remainder to fill new posts in the Ministry of Health.

6 Laboratory Assistants were given refresher courses on advanced laboratory technique including the Kahn Test.

Dispensers Training School—Khartoum Hospital

The curriculum of the course includes recapitulation of Basic Sciences, *i.e.* Elementary Chemistry, Elementary Physics and Biology. Stress is made on Practical Dispensing and Pharmaceutics.

29 Dispensers were graduated till now and they are filling posts in the big hospitals.

The total number of students in the School at present is 9 including one from Somalia on a World Health Organization Fellowship.

Training of Radiographers

Ten candidates were taken in 1961 including one Yemenese on a World Health Organization Fellowship.

The School of Radiography gives a course of training for two years for candidates of school certificate level.

Theoretical teaching is given in Electricity, Photography, Anatomy, Nursing as well as in radiographic methods and practice. All allied fields of study are dealt with according to their degrees in connection with radiography.

Practical Radiography. Dark Room practice and the practical handling of Machines, X-Ray hazards and all allied subjects are dealt with.

Eye Hospital — Khartoum

An Ophthalmic Assistants' School was established in 1953 and the intake was two students every two years.

Students for the School are always selected from the certified Mumarids (Rais Anbar or Wakil Rais Anbar status). The duration for studies in the School is two years. The students have studies on Eye Diseases, Elementary Anatomy and Physiology, and Diseases which have an effect on the eye.

The intake was increased to 5 during 1955 and 1957 and to 10 students since 1959.

So far 32 Ophthalmic Assistants were graduated.

10 Students are at present in the School.

Training of Other Staff

The School of Training of Higher Nurses and Dental Assistants is mentioned under the World Health Organization Assisted Projects.

The Training of Midwives and Health Visitors is mentioned under the Chapter of Social Hygiene.

CHAPTER VII
EXISTING HOSPITALS, DISPENSARIES AND DRESSING
STATIONS AND BEDS AVAILABLE 1961/62

TABLE XXXV

Province	Hospitals (65)	BEDS IN HOSPITALS					Dispen- saries	Beds in Dispens- aries	Total Beds in Hospitals and Disps.	Dressing Stations	Popu- lation	Beds per 1,000 Po- pulation in Hospitals and Disps.
		General	T.B.	Child- ren	Mater- nity	Total						
Bahr El Ghazal	Wau ..	180	86	8	9	283)	15	134	672	51	1,256,000	0.53
	Rumbek ..	127	—	—	—	127)						
	Aweil ..	48	—	—	—	48)						
	Raga ..	40	—	—	—	40)						
	Tonj ..	40	—	—	—	40)						
		435	86	8	9	538						
Blue Nile	Wad Medani ..	350	120	73	54	597)	134	89	1,942	157	2,512,000	0.77
	Rufaa ..	100	—	—	—	100)						
	Dueim ..	98	16	—	16	130)						
	Geteina ..	60	—	—	—	60)						
	Abu Usher ..	180	40	—	14	234)						
	El Huda ..	12	—	—	8	20)						
	Sennar ..	156	—	8	—	164)						
	Singa ..	130	54	—	10	194)						
	Kosti ..	152	—	—	16	168)						
	Rosseires ..	74	—	—	28	102)						
	Kurmuk ..	84	—	—	—	84)						
		1,393	230	81	146	1,853						
Darfur	Fasher ..	184	8	12	44	248)	45	466	1,053	40	1,580,000	0.67
	Nyala ..	88	—	4	8	100)						
	Geneina ..	96	—	4	—	100)						
	Zalingei ..	75	—	—	—	75)						
	Dacin ..	54	—	4	6	64)						
		497	8	24	58	587						
Equatoria	Juba ..	276	64	37	39	416)	41	432	1,598	50	1,078,000	1.48
	Lui ..	45	8	3	4	60)						
	Maridi ..	101	19	—	9	129)						
	Li Rangu ..	109	20	—	8	137)						
	Sources Yubu ..	115	—	—	6	121)						
	Yei ..	65	14	—	4	83)						
	Kapoeta ..	70	—	16	—	86)						
	Torit ..	123	10	—	1	134)						
		904	135	56	71	1,166						
Kassala	Kassala ..	254	42	20	16	332)	51	200	1,359	56	1,178,000	1.15
	Gedaref ..	198	24	12	4	238)						
	Aroma ..	100	—	—	—	100)						
	Port Sudan ..	249	68	23	26	366)						
	Toker ..	63	—	—	—	63)						
	Sinkat ..	60	—	—	—	60)						
		924	134	55	46	1,159						
Khartoum	Khartoum ..	653	—	135	46	834)	33	45	2,053	22	615,000	3.34
	Thawra and ..	—	401	24	—	425)						
	Abu Anga ..	297	—	48	—	345)						
	Omdurman ..	146	—	42	20	208)						
	Khartoum North ..	108	—	10	—	118)						
	Eye Hospital ..	40	—	—	—	40)						
	Abu Deleig ..	—	—	—	—	—)						
	Maternity Hospi- ..	—	—	—	38	38)						
	tal, Omdurman ..	—	—	—	—	—)						
		1,244	401	259	104	2,008						
Kordofan	El Obeid ..	296	60	29	27	412)	66	651	1,738	65	2,134,000	0.81
	Kadugli ..	129	8	—	3	140)						
	Abu Gebeih ..	80	—	12	8	100)						
	Dilling ..	66	8	4	8	86)						
	Talodi ..	62	—	—	1	63)						
	Nahud ..	107	10	9	3	129)						
	Rigl El Fula ..	42	—	—	4	46)						
	Bara ..	38	—	5	5	48)						
	Um Ruaba ..	55	—	—	8	63)						
		875	86	59	67	1,087						
Northern	Atbara ..	217	36	16	19	288)	69	87	1,095	90	1,036,000	1.06
	Halfa ..	120	46	22	14	202)						
	Shendi ..	58	—	8	2	68)						
	Dongola ..	65	12	1	8	86)						
	Berber ..	86	—	10	4	100)						
	Merowe ..	70	6	8	—	84)						
	Borgeig ..	50	—	10	—	60)						
	Delgo ..	60	—	—	—	60)						
	Abu Hamad ..	56	—	4	—	60)						
		782	100	79	47	1,008						
Upper Nile	Malakal ..	207	83	22	16	328)	35	254	834	28	1,080,000	0.77
	Bor ..	100	—	—	—	100)						
	Renk ..	68	—	—	—	68)						
	Bentui ..	61	20	—	3	84)						
		436	103	22	19	580	489	2,358	12,344	559	12,469,000	0.99
	TOTAL	7,493	1,283	643	567	9,986						

The ratio for Hospital Beds only is 0.8 per 1,000 population.

CHAPTER VIII
ANNUAL REPORT
STACK MEDICAL RESEARCH LABORATORIES
FOR THE PERIOD
From 1.7.1961 To 30.6.1962

By
DR. M. A. HASEEB

This report covers the period from July 1st., 1961 to June 30th., 1962. During this period *ad hoc* research was carried out on Kala-Azar, Small-pox, Yellow Fever, Onchocerciasis, Scorpion Venom, Diarrhoeal Diseases, etc. Summaries of these and other subjects will be found under the appropriate headings.

A great part of the time of the staff was spent on training of technicians, female nurses from Khartoum Nursing College, Police Cadets and laboratory assistants.

Among visitors to the Laboratories were Dr. L. Lapeyssonnie, W.H.O. Consultant who stayed for about a week doing research work on cerebro-spinal meningitis fever. Dr. Ahmed El Halawani from the Eastern Mediterranean Region Office, Alexandria, also visited the Laboratories for consultation. Other visitors were Sir Robert Platt, President of the Royal College of Physicians, London, Professor Herrison, Post-graduate Medical School of London, Professor Wilson, Makerere College Medical School, Kampala, Uganda, Professor George Cunningham, Royal College of Surgeons, England and Dr. Herbert Kraus, Under-secretary of State of Health, Belgrade, Yugoslavia.

The writer together with Dr. M. H. Satti and Dr. M. D. Sherif attended the W.H.O. Region Conference on Onchocerciasis at Brazzaville from 12-17.6.1961, where a paper "Onchocerciasis in the Sudan" was read and the delegates took part in the discussions.

EDUCATIONAL AND ROUTINE ACTIVITIES

Thirty-eight laboratory assistants were trained during this period in two batches. Ten of them were employed by the Army Medical Corps to fill new posts; three of them came from the Republic of Somalia sponsored by the World Health Organization and the remainder to fill new posts in the Ministry of Health.

The candidates from Somalia completed the laboratory assistants' course and then were put on special training in biochemistry and bacteriology for a period of six months. The candidates found their studies extremely useful and they would return to their own country—Somalia—to work under Sayid Ahmed Mustafa Salih—Sudanese Laboratory technician seconded to the World Health Organization in Somalia.

Six laboratory assistants were given refresher courses of two to three months' duration on advanced laboratory technique including the Khan Test.

Laboratory assistants from the Department of Veterinary Sciences and Faculty of Medicine, University of Khartoum were also given training in the care and breeding of laboratory animals.

12 female students from the Nursing College, Khartoum were given practical classes in bacteriology, haematology and parasitology.

The police cadets from the Police College, Khartoum were given lectures and practical training on Forensic Medicine. A total of thirty-six lectures and practicals were given.

TECHNICIAN CLASS

Two technician trainees completed their studies and were absorbed in the technician cadre. One technician was permanently seconded to the Ministry of Education.

Four more technician trainees were recruited from the secondary schools and have started their studies. One technician, Abd El Rahman Abu El Gasim, has been sent to the United Kingdom to gain further experience in laboratory work.

ROUTINE WORK

A summary of the routine work and research carried out during the period under review is appended to the report.

The total number of examinations was 48,489 as compared with 44,920 in the previous year and 43,228 in 1959/60.

The demand, for all three vaccines, small-pox, rabies and T.A.B. has increased tremendously. The dried type of small-pox vaccine is being still produced on an experimental scale.

Anti scorpion serum, on a small scale, was prepared locally for the first time

FORENSIC MEDICINE

Dr. Mirghani Yousif Ali continues to give lectures and demonstrations on Forensic Medicine to students of the Faculty of Medicine, University of Khartoum and also to the Police Cadets of the Police College, Khartoum. Dr. M. A. Hasseeb acted as external examiner on Forensic Medicine and Toxicology to the Faculty of Medicine as in previous years.

Because of the colossal increase in the requests for forensic medicine examination by the Police and the diverse nature of the tests required, it becomes imperative that a separate Forensic Medicine laboratory be established entirely for this purpose. Such a department is envisaged in the building of the Sudan Institute for Medical Research which is now under construction.

LYMPH VACCINE

The issue of lymph vaccine was 2,500,000 doses this year compared with 2,410,600 doses last year. More dried small-pox vaccine is being prepared although the bulk is still of the glycerinated type.

A colony of white leghorn chickens was started and an egg-incubator obtained for the purpose of carrying out potency tests on eggs, and for any virus research work on the developing chick embryo.

LYMPH VACCINE PREPARATION

135 sheep were used this year for the production of 8,873 grams of pulp with an average of 58 grams per sheep. The vaccine prepared is enough to vaccinate 2,218,250 persons. The bulk of the vaccine is still of the glycerinated type.

PATHOLOGICAL SPECIMENS

The pathologist reports as follows :—

The number of specimens received in this department is very similar to that received last year. There is no increase in malignant tumours. Figures are almost identical. It is hoped that doctors will be more enthusiastic in future and more specimens are sent in. To get a fair idea about incidence of malignant tumours a ruling should be made to guarantee that *all* tumours removed are histopathologically examined.

Total biopsy specimens	..	..	..	..	1,677
Total Neoplastic Disease	..	..	..	..	496
Benign tumours	..	..	..	..	280
Malignant tumours	..	..	..	..	216

Analysis from above figures :—

MALIGNANT TUMOURS

Classification								Total No
1 Group (1)	..	..	..	..	..	..	..
Squamous Carcinoma and Carcinoma Simples	..	..	..	..	..	..	..	83
11 Group (2)								
Glandular Carcinoma	..	..	..	..	..	..	..	29
111 Group (3)								
Sarcomas	..	..	..	..	..	..	..	16
1V Group (4)								
Lymphomas and Vascular Tumours	..	..	..	..	..	..	..	3
V Group (5)								
Adamantinomas and Teratoid Tumours	..	..	..	..	..	..	..	11
V1 Group (6)								
Melanoma and Retinoblastoma	..	..	..	..	..	..	..	17
V11 Group (7)								
Secondary and Undifferentiated Tumours	..	..	..	..	..	..	..	16
V111 Group (8)								
Borderline Tumours and Carcinoma in Situ	..	..	..	..	..	..	..	41
TOTAL MALIGNANT TUMOURS =								216

ANATOMICAL LOCATION OF MALIGNANT TUMOURS

(1)	Lymphatic and vascular	..	..	..	..	..	19
(2)	Respiratory tract	..	..	..	..	..	8
(3)	Upper digestive tract	..	..	..	..	..	17
(4)	Lower digestive tract	..	..	..	..	..	6
(5)	Abdominal cavity	..	..	..	..	..	6
(6)	Urinary and male genital organs	..	..	..	..	..	19
(7)	Female genital tract	..	..	..	..	..	54
(8)	Musculo-skeletol system and eyes	..	..	..	..	..	58
(9)	Special glands and endocrine glands	..	..	..	..	..	27
(10)	Organs not specified	..	..	..	..	..	2
	TOTAL	..	..	..	..	..	216

GYNAECOLOGICAL PATHOLOGY

(Out of the total biopsy specimens)

Total gynaecological specimens	750
Total endometrial curettings	473

(of the total gynae. specimens)

Out of 73 endometrial specimens examined, 289 were found to show endometrial phase disturbance either associated with sterility or profuse bleeding in Metropathis.

FORENSIC SEROLOGY SPECIMENS

Forensic serology specimens (blood and seminal stains) examined in this department reached the total of 523 specimens.

Blood stains	—	102	specimens
Seminal stains	—	421	specimens
TOTAL	—	523	specimens

RABIES

285 brains were received of which 41 were decomposed and useless for examination of the remaining 51 were positive for Negri bodies. This contrasts with 83 positive of 409 brains received last year.

The species of animal infection and the distribution of positives and negatives in the past year is shown in the following table :—

ANIMAL	Positive	Negative	Decomposed	TOTAL
Dogs	33	144	24	201
Cats	3	19	7	29
Donkeys	8	12	5	25
Goats	6	10	2	18
Horses	1	2	1	4
Calves	—	2	1	3
Sheep	—	2	—	2
Cows	—	2	1	3
TOTAL	51	193	41	285

RABIES VACCINE

721,125 ml. doses were issued this year compared with 697,750 ml. doses in the previous years. The amount issued this year is sufficient to treat 10,302 cases. The vaccine is phenolised and killed fixed virus prepared according to the recommendations of the W.H.O. meeting at Muguga, Nairobi, 1955.

DIARRHOEAL DISEASES

The laboratories welcomed the co-operation of the World Health Organization Diarrhoeal Diseases Advisory Team to carry out research work on this very important subject. The summary of the report as written by the Team is as follows :—

“ The W.H.O. Diarrhoeal Diseases Advisory Team spent three months in the Sudan. It carried out work during the dry season —actually during the hottest period of the year. For a few days after arrival, discussions were held at the Ministry of Health on the problem of diarrhoeal diseases in the Sudan. Following these discussions, and before making a choice on where to carry out the work, the team visited various medical and public health services in a number of towns and villages in Central Sudan.

As a result of the visits and discussions, Stack Medical Research Laboratories were chosen for the laboratory work, and a number of areas were selected for the field survey.

The study areas were :—

- (1) Banat, a planned area representative of new developments and town-building in Central Sudan. This area is part of Omdurman City.
- (2) Fetahab, a village not far from Omdurman; and—being an unplanned area—representative of the average older type of Sudanese village in Central Sudan.

Differences exist between the two areas in socio-economic level, education, and environmental sanitation. Both, however, are provided with almost equal opportunities of getting medical help through the health centre ; the distance from the village to the nearest hospital, however, was greater for Banat.

A *household survey* was carried out in both of the areas on socio-economic status, housing, and status of sanitation (including water-supply and use of it). In addition, the composition of the family and some of the particulars of each member of the family including information on diarrhoea were recorded.

Subsequently, during the team's stay, three *individual surveys* were carried out in both areas ; morbidity data on diarrhoeal diseases were collected, and rectal swabs were taken from each child under six years. A *bacteriological survey* conducted at the same time included a search for *Shigella* and *Salmonella* in children under six years of age, and for pathogenic *E. coli* in children under six years of age. *Drinking water examination* was carried out in the laboratories of the Khartoum Water Plant. Fly counts were done in both areas.

We experienced the usual difficulties that belong to any field work, and in the laboratory we shared in particular such difficulties of the Sudanese as lack of staff and, to some extent, lack of equipment.

Statistical data was available in the health centres, but no reliable information could be obtained from the hospitals.

Comparing the results of the study of the data locally available from the health centre with those of the survey, it may be concluded that practically all children in Banat visit the Banat Health Centre to be treated for diarrhoea, while in Fetahab probably over 50 per cent do not report to the health centre at all.

Information from the records of the Church Missionary Society Hospital shows that a great number of children are admitted with diarrhoea. A fairly large number of beds are occupied by diarrhoeal patients the whole year round, and yet only seriously ill cases are taken. The annual case fatality rate for diarrhoea patients, including those with amoebic dysentery, is nine per cent. Malnutrition and kwashiorkor are still present.

Household survey data shows that during a one-month period 21.8 per cent of children under six in Banat and 26.6 per cent in Fetahab experienced at least one spell of diarrhoea. Socially and economically, and from the point of view of sanitation, Fetahab is far behind Banat.

With each group we attempted to assess the influence of a number of separate factors we thought might be of influence in either increasing or decreasing the number of cases in diarrhoea. For this purpose we tried to establish a number of homogeneous groups differing in one factor only. However, no such groups could be established. As regards the influence of the amount of water used on the number of diarrhoea cases, an inverse relationship was discernible.

Although the population in Banat is provided with high quality water under pressure piped into their enclosures or houses, they stick to the local habit of using zeers (colling jars) to keep their drinking water in. Bacteriological examination showed that 100 per cent of these zeers were faecally contaminated.

In the socio-economically low class area (Fetahab) the availability of an insanitary privy increased the number of diarrhoea cases considerably.

Data from the individual survey showed that in the area with low living standards each spell of diarrhoea lasted twice as long as in the better area of Banat.

In the better-class area there are more spells of short duration, whilst in the low-class area there are more of longer duration.

Information obtained from patients with diarrhoea showed that the number of stools per day was 3-6, which is in accordance with the bacteriological findings that practically all cases are due to *Shigella*.

Most of the cases of diarrhoea occurred in the age groups of one and two years.

Swabs were put in buffered glycerol saline solution, transported in thermos bottles with ice and plated within two hours. They were examined for *Shigella*, *Salmonella* and pathogenic *E. coli*. The normal media were used, S.S. agar, McConkey selenite broth and Kohn's two-tube media. The typing was carried out by the team.

All children under survey were examined for *Shigella* and *Salmonella*. In addition those under two years of age were examined for pathogenic *E. coli*. The infection rate was 8.3 per cent in Banat as compared with 19.0 per cent in Fetahab (all causes). Swabs were taken from the groups of children with active diarrhoea admitted to Omdurman Civil Hospital. Cultures (all causes) were positive in 19.6 per cent. Practically all cases were in those under two years of age. As far as the isolation of pathogens is concerned, it should be noted that a high (unknown) number of patients received treatment with sulfonamides before the swabs were taken.

Of the isolated pathogens 14 per cent were *Salmonella* (six types), 68.7 per cent were *Shigella* (mostly group B) and 17.3 per cent were pathogenic *E. Coli* (four serotypes). The disc technique was applied in making antibiograms. Over 60 per cent of the *Shigella* strains were resistant to sulfa drugs.

CONCLUSIONS

While studying the data locally available, we found that the existing simple system of recording in the health centres was satisfactory. It was nevertheless impossible to evaluate the present status of diarrhoeal diseases by using them, as a great number of people in the rural area with diarrhoea never go for treatment. In the hospitals the recording system was incomplete, so that no use of their data could be made.

Records are not kept as a daily routine.

There is great difficulty in the classification of the diarrhoeal diseases. Births and deaths are not recorded anywhere, so that vital statistics cannot be developed. Lack of qualified personnel in all branches is the main cause. Training is urgently needed.

The clinical diagnosis in diarrhoeal cases has to be improved, as the diagnosis "diarrhoea" is not one on which the right treatment can be based.

At the moment the diagnosis of diarrhoea automatically results in treatment with sulfonamides in practically all cases. Sulfa doses and length of treatment are different in different places.

Uniform methods should be developed for the treatment of diarrhoeas. Other drugs should be used as well, as 60 per cent of the strains are sulfa-resistant. As far as improvement of the clinical diagnosis is concerned, simple microscopical examinations of stools on the spot should be done more frequently.

The clinical staff should be inculcated with the view that bacteriological confirmation of the diagnosis is necessary.

As it is impossible to examine each case bacteriologically, this should be done for difficult cases only.

During our work we got the impression that most of the members of the clinical as well as nursing staff know too little about sending specimens of any kind to the laboratory in a proper way and at the proper time.

Specimens exposed during transport to high temperatures, sometimes for days on end, are of no value to the laboratory. Specimens should not be left for hours outside refrigerators before being sent to the laboratories.

If these improvements are made, considerable increase may be expected in the dispatch of specimens to Stack Laboratories, which are the only laboratories available for bacteriological work. In their present state, the laboratories would not be able to meet such demands. Personnel and equipment will have to be increased. In the first place a bacteriologist will be needed, preferably with knowledge of the entero-bacteriaceae. One, and preferably two, laboratory technicians with additional training in this field will be needed as well. They should work continuously in this particular field. In general routine bacteriological methods could be improved.

Specimens received after being exposed to high temperatures for several days should be discarded. Examination of these specimens results in an almost 100 per cent negative result.

More collaboration is advisable with the veterinary services, especially in the field of salmonellosis.

There is no epidemiologist available. Training of a suitable number of young doctors is advisable and urgent.

The step undertaken by the Government to provide every household with water under pressure in Banat could not be proved to be effective in bringing down the intensive rate of diarrhoea in the families. We found that water of high quality is supplied to the population. This water for drinking is kept in cooling jars (zeers) in accordance with old customs and we found all these zeers faecally contaminated. This problem certainly needs attention from the public health services, and further study would be advisable.

Insanitary privies in Fetahab increased the numbers of diarrhoea cases considerably. Inspection by sanitary officers is advisable.

Our conclusion from the individual survey is that in the socio-economically low-standard area, which is also of low standard from the sanitary point of view, the average spell of diarrhoea lasts twice as long as in the better area. This is of course due to many factors but is evidently also caused by poor attendance at the existing health centre. In the low-standard area, there are more cases of diarrhoea of longer duration; in the better area more of shorter duration.

Practically all cases of diarrhoea had six or less stools a day. This coincides with our bacteriological findings that the majority of the cases are due to shigellosis. The number of cases of salmonellosis and infections with pathogenic *E. coli* is far less.

Bacteriological findings show an infection rate for children under six of 8.3 per cent in Banat and 19 per cent in Fetahab. The majority of pathogens were isolated from children under three years of age. Shigellosis is by far the most important causes of diarrhoea due to bacterial agents.

Sensitivity tests showed that over 60 per cent of the isolated *Shigella* strains were resistant to sulfa drugs. In conclusion, we may say that in general it proved to be extremely difficult during the study to evaluate separately the many factors hygienic, social, economic, or educational—that influence the high rate of diarrhoeal diseases in the two study areas. However, the study showed that in the more advanced area (Banat) the situation was already much better than in the other area (Fetahab).

As in the problem all the factors listed work together and closely influence each other, we would certainly recommend that the Sudanese Government continue with its improvements of environmental sanitation with particular reference to water supply and sanitary faecal disposal. We also recommend at the same time that the Government, through the Ministry of Health, embark upon an educational programme."

YELLOW FEVER

The epidemiology of the Yellow Fever outbreak in the Fung District (1959) has been reported in detail by Sati, Haseeb and Khair (in the press). The summary of their findings is as follows:—

The outbreak started as an influenza-like disease and had actually been diagnosed by the dispensary staff as influenza. In Wedeka, Miac, Chail and Doro about 1,818 cases were encountered with this type of illness. This is considered as a mild form of the disease in view of previous experience in the Nuba Mountains (Kirk, 1941). Only 8 deaths were reported among these. The deaths occurred in some of these cases after an attack of melaena or black vomit. Over 50 per cent of those affected were children.

(a) 114 classical cases were reported, of whom 89 died. Both sexes were affected. These classical cases picked up young adults of both sexes. There is evidence that a similar state of affairs prevailed on the Ethiopian side.

(b) Viscerotomy liver sections obtained from two cases, one from Doro and the other from Kurmuk strengthened the suspicion of the diagnosis. This, when taken with the classical cases makes the diagnosis certain—the acute onset, short duration of illness in which the patient is either dead or alive in a matter of a few days, the severe backache, headache and pain behind the eyes as well as the black-vomit and melaena and pain in the loins.

(c) The morbidity rate was 0.7 per thousand, population the population at risk being 160,000 and if we consider the classical cases only (114) to be yellow fever. The attack rate will be much higher if we consider also the mild cases; it will be 11.36 per thousand population.

The case fatality rate will be $89/114 = 78$ per cent for those ill. If we consider the mild infections the case fatality rate will be 5.02 per cent.

(d) The outbreak came to light at a time when it was fast declining because of interruption of transmission as by then the dry season had set in. (Early November). But in actual fact the disease started in July and August reaching a peak in October (1959). In July the nursing orderly in charge of the dispensary at Daga Post developed the disease and died. As the place was completely cut off, no news reached the Ministry Headquarters until 2 months later. His death was assumed to have been due to malaria at first. When the disease reached Kurmuk where there is a hospital and a qualified Medical Officer, suspicion of Yellow Fever became apparent.

(e) Sources of the outbreak probably started on the frontier in the Fung itself. But it is clear that both sides of the border are infected, as half the tribe is on one side of the border and the other half is in the other side.

(f) It is suggested that the disease started as the jungle type of yellow fever initiated, most probably by *Aedes vittatus*, in the monkey population and continued in humans by this agent. There is also the likelihood that man to man cycle had been perpetuated by *Aedes aegypti*, which was found to breed out of doors.

(g) Collections of biting insects were carried out at the same time and during the wet in the following year. *A. Vittatus* predominant and *Aedes Aegypti* found.

Lewis in the Nuba Mountains in 1941 suggested then that *A. vittatus* was the probable vector of the disease in the 1940 epidemic of yellow fever.

(h) Attempts to isolate the virus was unsuccessful.

Finding immune bodies in human blood sera was not resorted to on a large scale.

These results showed suggestion of cross immunisation with other group B arthropod viruses *e.g.* West Nile virus.

Control measures were discussed with particular reference to mass vaccination with the hypospray jet-injectors.

SCORPION VENOM

Studies in the venom of scorpions were made as a prelude to preparation of anti-scorpion serum for use in man.

Collection of Scorpions :

The following species of scorpions were collected :—

1. *Buthus minax* : This small black scorpion was found in large numbers in the Sunt Forest of Khartoum. The scorpions usually clustered under the bark of the acacia trees. The venom of this scorpion is comparatively mild. The amount contained in one telson was not enough to kill a guinea-pig. It was found that three telsons required 50 minutes to kill a guinea-pig of 240 grams.

2. *Buthus quin-questeratus* : This yellow medium-sized scorpion is found in large numbers in Omdurman. The M.L.D. of the venom of this scorpion to a guinea-pig of 240 grams was contained in $1/30$ of a telson. In other words the venom of this scorpion is about one hundred times as potent as that of *B. Minax*.

3. *Nanobuthus andersoni* : Scorpions of this species were received from Rahad. The M.L.D. to guinea-pig was contained in $1/10$ of a telson.

4. *Parabuthus liasoma* : Scorpions of this species were received from Toker. The last two apical segments of the tail and the poison gland were black in colour. but the maxillary bands were yellow. The poison gland was hairy.

Signs and Symptoms of Scorpion Poisoning in Guinea-pigs

The guinea-pig feels severe pain immediately on injection and starts screaming. After about 15 minutes from receiving one lethal dose, lachrymation of the eyes and salivation from the mouth and nose are noticed. Then the tears become frothy and the guinea-pig passes urine and watery stools. Respiration becomes difficult and convulsions and fits start, followed by death in about 30 to 45 minutes from the time of the injection.

It is noticed that white rats develop bleeding in the conjunctivae and the tears are blood stained and therefore red in colour. White rats on the whole are more resistant to the venom than guinea pigs.

Feeding of Scorpions

It is a well known fact that scorpions feed on small insects *e.g.* flies, locusts, cockroaches, etc. In the beginning, therefore, scorpions, in captivity, were fed on grass hoppers, cockroaches and flies. Later on it was found out that scorpions fed very voraciously on raw liver, lung and kidney. These were provided either from rabbits in stock or sheep from the market.

Scorpions however can last for months without food or drink (Haseeb, 1950)

The Effect of Venom on Cats

Four adult cats were injected subcutaneously with scorpion venom ; one cat with 30 M.L.D., one cat with 15 M.L.D., one cat with 7 M.L.D., and one cat with one M.L.D. All four cats suffered from pain on injection and then after from 15 to 30 minutes developed diarrhoea. No deaths or other signs of poisoning.

The venom has been standardised on guinea-pigs of 240 grams in weight.

KALA-AZAR

Namru—3 Subunit at Malakal

The inaugural meeting of The Sudan Sub-unit, United States Naval Medical Research Unit Number Three took place on February 4—6, 1961 at Malakal. The Kala-Azar laboratory was officially opened by H.E. The Minister of Health.

The objectives of the project were stated as follows :—

1. To discover pattern and source of infection in the Sudan.
2. To determine vertebrate reservoir and arthropod vector.
3. To determine range, avenues of spread, intensity and cyclic nature of disease.
4. To suggest most effective means of control, employing epidemiological and ecological findings, as well as clinical and therapeutic measures.

The work of the sub unit was focused on the village of Tir, near Paloich in an area of high Kala-Azar incidence. Attempts were made to develop an epidemiological picture of the community. What animals are associated with the residents ; what sandflies bite these people, their animals and nearby wild animals ? This village consists of approximately 125 tukls and 500 people.

The staff of this sub-unit are all from Namru—3, Cairo.

Leishmanin Survey

Extensive studies by Dr. P. E. C. Manson-Bahr and his associates in Kenya, established that the Montenegro Intradermal skin test can be adapted for detection of past infection with Kala-Azar. He obtained a highly specific reaction using an antigen (Leishmanin) derived from the Heisch Kenya ground-squirrel strain of *Leishmania donovani* (6×10^6 organisms per ml. in 0.5 per cent carbol-saline). A specific skin wheel was found only in proven old cases but not in current infections, as the sensitivity response is not apparent until 3 to 6 months after cure. The test has been used in Kenya to study the response of persons vaccinated with the ground-squirrel strain of *L. donovani*, which produces a strong immunity, no evidence of disease, and a positive Leishmanin test.

Dr. Manson-Bahr, in his visit to the Sudan between April 21 to May 1, 1961, provided the antigen and supervised its administration.

Preliminary survey, conducted at Tir and nearby areas, determined the suitability of wide scale use of the Leishmanin test for epidemiological background information.

The results of this small survey were as follows :—

Results —

(a) Of 7 cured and microscopically proven cases with kala-azar, 6 gave strong positive reactions and one negative. All positive cases had completed treatment; the negative case had recently completed a course of pentostam.

(b) In Tir village, 50 people were tested. None of these had proven cases of kala-azar, though some had been treated and the disease is widely recognized among the residents. Of the 50 tested, 32 (64 per cent) gave strong positive reactions; 18 (36 per cent) were negative. A wide range of age groups were represented. No evidence of age grouping was apparent among the positives. (In Kenya it was found that positive reactors tend to fall into family groups, so that families with one or more proven cases tend to show a higher rate of reactors than others. Reliable medical records are not available for Tir, but it would be advisable to analyse data for larger-scale studies in the future on a family or tukl basis as well as by age and sex). There was some indication that the present grouping of positives fell into a non-random distribution by tukls :—

All residents of 8 tukls were tested. Of these, residents of 3 tukls were all positive
3 tukls were 50 per cent positive.

1 tukl was 66 per cent positive.

1 tukl was all negative.

Future confirmation of family grouping of reactors would support the hypothesis that subclinical cases are far more wide-spread than is generally thought to be the case. This in turn would indicate the importance of asymptomatic human carriers as reservoirs of the disease.

(c) In Paloich, 28 persons were tested, 17 (61 per cent) were positive and 11 (39 per cent) negative. No record of previous history of kala-azar was available. Residents and local transients from nearby endemic areas were included in the sample. All local medical personnel except one Shilluk assistant were negative.

(d) In Wanibol, a small village near Tir (tested at their toich location), 15 persons were tested, 13 (87 per cent) were positive, and 2 (13 per cent) negative.

(e) One proven case from Doleib Hill, cured $1\frac{1}{2}$ years ago : positive.

(f) Controls : current cases in Malakal Civil Hospital, one resistant and two responding cases : all negative.

NAMRU - 3 Sub unit personnel, 13 persons (2 Americans, 2 Egyptians, 9 Sudanese) : 12 negative ; 1 positive.

The single NAMRU - 3 positive case, Zachariah Arop, stated that he had kala-azar 10 years ago while attending school in Malakal. This represents the oldest recorded proven case giving a positive leishmanin reaction.

Results of this small sampling are comparable with those obtained in Kenya, where, in an area with much kala-azar, a high percentage of positive reactions to the test has been found. If further control studies can clearly establish the specificity of this reaction in the Sudan, the leishmanin test should become an epidemiological tool of the highest value.

LIST OF PUBLICATIONS DURING THE YEAR BY MEMBERS OF THE STAFF

Name and Initials of Author	Date of Publication	Title of Article	Title of Journal in which Published	Volume Number of Journal	Page No. of Journal
Haseeb, M. A. Satti, M. H. and Sherif, M. Satti, M. H. Haseeb, M. A. and Khair, A. .. Satti, M. H. }	Report to W.H.O. African Conference on Onchocerciasis In Press June, 1962	Onchocerciasis in the Sudan Yellow Fever in Fung District	Bull, W.H.O.	In Press	
Satti, M. H and Ali, M. Y. Satti, M. H. Ali, M. Y. .. A/Bakr Hassan A. } A/Halim, Mohed. and } Ali, M.Y. }	March, 1962 June, 1962 March, 1962 March, 1962	Early phase of an outbreak of Kala-Azar in the Southern Fung Laryngeal Leishmaniasis (Post Kala-Azar) Stress and Parasitism Reactions to the bites of bed bugs (Cimex Lectularius) A case of Gaucher's Disease	Sudan Medical Journal (New Series) Sudan Medical Journal (New Series) S.M.J. (New Series) S.M.J. (New Series) S.M.J. (New Series)	Vol. 1 No. 2 Vol. 1 No. 1 Vol. 1 No. 2 Vol. 1 No. 1 Vol. 1 No. 1	98-111 37-40 112- 11- 34-

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KHAN TESTS

	Positive	Negative	TOTAL
July, 1961	86	917	1,003
August, 1961	93	940	1,033
September, 1961	106	1,006	1,112
October, 1961	90	919	1,009
November, 1961	94	956	1,050
December, 1961	99	925	1,024
January, 1962	119	654	773
February, 1962	102	774	876
March, 1962	91	888	979
April, 1962	115	1,017	1,132
May, 1962	85	755	840
June, 1962	84	929	1,013
TOTAL	1,164	10,680	11,844

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FAECES

	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Total
Flexeneri	9	8	8	8	10	—	2	4	2	2	—	2	55
Shiga	4	4	3	3	7	—	—	1	—	—	—	1	25
B. Alkallesc	—	—	—	—	—	—	—	—	—	—	—	—	—
Ambigium	—	—	—	—	—	—	—	—	—	—	—	—	—
Sonne	4	2	—	—	—	—	—	1	—	—	—	—	7
T.	—	5	9	22	34	22	9	3	2	2	5	2	115
A.	1	1	2	1	1	3	1	2	—	—	—	—	12
B.	—	—	1	1	1	1	—	—	—	—	—	—	4
Amoeba	—	—	—	1	1	1	4	—	5	—	2	1	15
Ova	2	1	1	4	5	1	3	1	10	3	2	3	36
Negative	255	300	356	400	574	652	401	330	296	368	425	310	4,667
Total	275	321	380	440	633	680	420	342	315	375	434	319	4,936

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URINE

T.	—	2	1	6	10	7	6	3	1	—	2	1	—	39
A.	—	1	—	1	—	1	—	—	—	—	—	—	—	4
M.	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Ova	1	3	—	1	2	—	—	—	1	—	2	1	—	11
Negative	295	400	529	980	800	630	567	545	600	702	721	605	7,374	
Total	.....	.....	296	406	530	988	812	638	573	548	602	702	725	607	7,428	
MONTHLY TOTAL	.....	.....	572	727	910	1,430	1,445	1,318	993	890	917	1,077	1,159	926	12,364	

55

WIDAL REACTION

	July	August	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	Total
T.	53	60	70	40	110	70	55	47	52	60	25	50	692
A.	10	15	23	20	15	7	1	2	1	1	1	2	98
B.	14	20	28	10	5	15	12	12	3	2	2	1	124
M.	7	4	—	—	1	1	3	7	1	1	1	1	27
Negative	271	300	350	474	418	565	260	205	247	360	240	320	4,015
TOTAL	355	399	471	544	549	658	331	273	304	424	269	374	4,956

BLOOD CULTURES

	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	June	Total
T.	2	5	11	7	37	30	15	12	8	13	10	9	159
A.	—	—	—	2	1	3	1	2	1	1	2	1	14
B.	—	—	—	—	—	1	1	—	—	—	1	—	3
M.	—	—	—	—	—	—	—	—	—	—	—	—	—
O.O.	4	4	13	6	7	16	12	4	3	2	10	13	94
Streps	4	—	—	—	—	1	—	—	—	5	2	3	15
Sterile	62	70	87	144	144	118	76	67	80	118	135	115	1,216
Contaminated	60	73	86	98	98	74	62	70	50	84	55	71	881
TOTAL	132	152	197	257	287	243	167	155	142	223	215	212	2,382

MALARIA

	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	TOTAL
B.T.	—	—	—	—	—	—	—	—	—	—	—	—	—
M.T.	1	—	—	—	—	—	—	—	—	—	—	—	1
Q.T.	—	—	—	—	—	—	—	—	—	—	—	—	—
D.I.	—	—	—	—	—	—	—	—	—	—	—	—	—
Negative	32	25	30	16	10	—	10	6	20	24	34	28	235
TOTAL	33	25	30	16	10	—	10	6	20	24	34	28	236
K.A.	4	—	2	—	4	—	—	2	—	3	2	2	19
R.F.	—	—	—	—	—	—	—	—	—	—	—	—	—
Blood C.	34	30	28	38	40	28	30	34	35	36	40	38	411
Weil-Flix	—	—	—	—	—	—	—	—	—	—	—	—	—
Positive	—	—	—	—	—	—	—	—	—	—	—	—	—
Negative	—	—	—	—	—	—	—	—	—	—	—	—	—
TOTAL	38	30	30	38	44	28	30	36	35	39	42	40	430

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SUMMARY OF LABORATORY EXAMINATIONS

			Test		Urine	Gen. Bact. Biochem.		
July, 1961	1,003	558	572	1,048	152	3,333
August	..	..	1,033	606	727	1,289	130	3,785
September	..	..	1,112	728	910	1,617	137	4,504
October	..	..	1,009	860	1,430	977	121	4,397
November	..	..	1,050	890	1,445	1,088	114	4,587
December	..	..	1,024	929	1,318	1,105	167	4,543
January	..	..	773	538	993	1,480	176	3,960
February	..	..	876	470	890	1,231	158	3,625
March	..	..	979	501	917	1,244	102	3,743
April	..	..	1,132	710	1,077	1,292	180	4,391
May	..	..	840	560	1,159	1,153	125	3,837
June	..	..	1,013	654	926	1,076	115	3,784
TOTAL	..	..	11,844	8,004	12,364	14,600	1,677	48,489

Rabies Examination	Positive	51
	Negative	193
	Decomposed	41
	TOTAL	285

Vaccine issued during 1961/62							
T.A.B.	..	..	..	..	..	81,550 ml.	
Anti Rabie	..	..	..	..	..	721,125 ml.	
Staphylococcus aureus			..	..	..	1,750 ml.	
Doses of Vaccine Lymph			..	..		2,738,000 ml.	
Cholera	..	..	..	..	..	66,000 ml.	

ANNUAL REPORT OF THE SECTION OF
MEDICAL ENTOMOLOGY FOR THE YEAR 1961/62

By

M. Qidndtuuub

This year also the work in the Section continued on more or less, same lines as in the past which are as follows :—

- (1) Identification of *Anopheline* and *Culicine* adults and larvae sent to the Section.
- (2) Collection and identification of Phlebotomine Sandflies.
- (3) Identification of all insects of medical importance received from different parts of the country.

In addition to this the following special work was undertaken :—

- (1) A large collection of sandflies was raised from Gedaref, Shereik, Makatta, Shijarab, Jebel Meigel, Asubri, Sasreiba and Khashm-El-Girba.
- (2) Special collections of mosquitoes were made in Kosti, Tendelti, Rabak, Jebelein and Shuwal in the White Nile area.
- (3) A survey of medical insects was made in the area near Akobo on the Ethiopian border in the Upper Nile Province.
- (4) Studies on *Simulium damnosum* were made at Dagash, Abu Hasheem, Abu Teen, Mograt Island and Tagata in the Abu Hamad area in the Northern Province.
- (5) Studies on the laboratory bionomics of the strains of *Aedes aegypti* continued in the laboratory.
- (6) In view of reports of occurrence of resistance to insecticides in the common mosquito *Anopheles pharoensis* efforts were made and still continue to maintain a laboratory colony of the species to enable us (a) to estimate its susceptibility to DDT and BHC in the laboratory, (b) to study bionomics of the mosquito in the laboratory also. Some details will now be given in the following about the work done on different medical insects during the period.

Culicidae (Mosquitoes)

Mosquitoes collected by the Section as well as those sent by workers in the provinces were identified which are listed in Appendix A. As it would appear from the Appendices A1, A2, A3 one species belonged to the genus *Toxorhynchites*; 8 to *Culex*; 8 to *Anopheles*; 4 to *Aedes*; one to *Mansonia*; one to *Culiseta*; one to *Aedomyia* and one to *Eretmapodites*. Thus they comprised 8 different genera and 25 species.

Mosquitoes and Yellow Fever

With a view to ascertaining the different species that bred during the rainy season in Equatoria and to know the density of the different species, Abbas Eff. Ibrahim Mohammed, the junior technical assistant was sent to the area with instructions to collect mosquitoes biting around the houses, in the bush and inside huts, etc. both during the night and by day. But unfortunately the collection brought by him did not prove of any use since it all comprised the common *Anopheline* species. It appears he collected them from the human dwellings only. Moreover, they were stored in such a bad condition that they could be identified with great difficulty as being damaged and denuded—most of them had lost their diagnostic features. Nor did he give any idea of the breeding places of a number of Culicine, Aedine and *Eretmapodites* mosquitoes that are known to breed in the region, by collecting the early stages. Some species of the last genus, such as *E. chrysogaster*, are known to bite man and hence at times suspected as the probable vector of yellow fever in the area.

Sandflies

This year also a considerably large collection of sandflies was raised from different places in the country all of which was made by the staff of the Section. About 750 specimens were examined and 7 different species recognised (Pl. See Appendices C. and D). The females seem to account for a larger number than the males *viz.*, nearly 1.6 times the males. Apart from this a large number of *Phlebotomus papatasii* is often collected for various experiments in the laboratory. It is interesting to note that a single female of *P. darlingi* was taken from Tozi in a large collection comprising a much larger number of other species. This species is so far known only from Tozi in the Sudan and is mostly collected in May from the area. *P. crypticola* described by Abonnenc and others from West Africa closely resembles this species and it might ultimately be proved to be a synonym of *P. darlingi* Lewis and Kirk. The hitherto unknown female was discovered last year in Tozi area.

A special kit has been devised by the W.H.O. for testing the susceptibility of sandflies to various insecticides. On my request they have sent us one such set. Experiments to estimate the susceptibility of the common Sudan species of sandflies are in good progress. This could be possible by creating optimum micro-climatic conditions in the laboratory for the delicate insect so that almost 0 per cent control mortality is achieved. These experiments in due course will establish the base line of dosage of Dieldrin and DDT for the Sudan strains which will also enable us to compare notes with workers in other parts of the world since very little work of this nature has so far been done on sandflies and almost no data is on record as yet. Besides this, experiments are being conducted in the laboratory to study the effect of sub-lethal doses of insecticides on the general behaviour of the flies with special reference to feeding, egg development and oviposition. Handicapped as we are due to the unfortunate fire that broke out in March this year, efforts are being made to ensure that the progress is not totally hampered.

Simulium

In view of the importance of *Simulium damnosum* in the Northern Province both as a nuisance and as the vector of *Onchocerciasis* in and around Abu Hamad on the request of the Medical Entomologist the question of the possibility of control of the pest by treating the river with DDT was once again taken up by the Assistant Director, Research.

In reply to the Medical Entomologist's letter ME 4.4 dated 20.12.61, the Director, Medical Services informed him that the P.M.O.H. promised to arrange for the necessary transport and the Specialist in charge of eye diseases put at our disposal an imprest sum of LS. 200 and that the insecticide required for a preliminary experimental operation would be shipped by the C.P.H.I. On this a meeting was held at the Stack Medical Research Laboratories, Khartoum, which was presided over by the Asst. Director, Research and attended by the following : 1. Dr. Mohd. Rashad Farid, Asst. Director, Development, 2. Dr. Mohd. Hamad Satti, Medical Zoologist, 3. Dr. Mohd. Sharif Dawood, the Ophthalmic Specialist, 4. Syd. Khalfalla Babiker and the Medical Entomologist. In this meeting the various matters connected with the proposed insecticidal treatments on an experimental basis came up for discussion. The Medical Entomologist insisted on the great importance of the discharge of water at various points in the area which would determine the quantity of DDT and hence the equipment required. This meeting under the guidance of Dr. Mansour Ali Hasseeb, Assistant Director, Research came to certain decisions which were later reported by Dr. M.H. Satti (Pl. see Minutes of the meeting held on *Onchocerciasis* at Abu Hamad on 17.2.62.) Soon after this the Medical Entomologist proceeded to Abu Hamad with a view to undertaking work there on the following lines :- (1) To estimate the density of *Simulium damnosum* in the area, (2) To select a suitable site 40—50 miles upstream of Abu Hamad for the treatment of the river with DDT. For the suitability of the place the following standard was set :- (a) Sufficiently heavy incidence of *Simulium damnosum* adults, larvae and pupae, (b) Accessibility of the place by car, (c) Availability of a ferry boat and labourers in the area for treatment of the river with DDT. Several places such as (1) Dagash, 20 miles upstream, (2) Abu Dis, 30 miles upstream and (3) Abu Hasheim, 54 miles upstream of Abu Hamad. Intensive search made for adults and the early stages failed to produce any of these stages of *Simulium damnosum*.

The reason for this absence of the pest this year may be the periodical fluctuations in the insect population in nature. However, the suitable site for the operation was found to be Abu Hamad or Dagash about 20 miles upstream.

The above information was provided in a report submitted by the Medical Entomologist after returning from Abu Hamad to the Director, Medical Services and Assistant Director, Research and other members which was considered at a second meeting held at the Stack Medical Research Laboratories. This meeting also was presided by the Assistant Director, Research and attended by the following :—

- (1) Dr. M. H. Satti.
- (2) Dr. Mohd. Sharif Dawood.
- (3) The Medical Entomologist.

At this meeting the Medical Entomologist read out his report of his visit to Abu Hamad and also presented the figures of Monthly Mean Discharges of the Nile at Atbara and Abu Hamad obtained by him from El Syed Taufiq Bey, Inspector General, Egyptian Irrigation, Khartoum to whom the former was kindly introduced by Dr. Mansour.

The following decisions were taken at the meeting :—

It was therefore agreed upon that the Medical Entomologist will send members of his staff to Abu Hamad area to do monthly catches for a complete year commencing from May, 1962. It is so far known that the maximum seasonal incidence in that area is from November - March.

Dr. Sharif will carry out a survey of incidence of *Onchocerciasis* in the population of the area in the period between next September and October, (1962).

Dr. Sharif will contact Steamers Department, Khartoum North about hiring or purchasing motor boats for the purpose of *Simulium* survey and control work if found feasible.

In the event that case survey shows low incidence of human infection it will then be decided to adopt the cheaper method of control or eradication of the disease whether it is vector control or case treatment.

A party that visited Abu Hamad in the month of May, 1962, collected a few biting adults and larvae and pupae attached to the grass in the river near the Mograt island shore.

The monthly inspection of the area for *Simulium damnosum* will continue as a routine as mentioned above.

Hatchery

Three strains of *Aedes aegypti* were being maintained in the Laboratory for over 4 years. But as already reported a fire broke out in the Entomology Section of the Agriculture Research Station on 21st March, 1962, in the afternoon due to which all the sheds used by the Section were gutted and were charred within a matter of two hours. This fire broke out at about 2.10 p.m. The Medical Entomologist was informed by phone by the Laboratory Attendant, El Daw at 3.0 p.m. The Medical Entomologist arrived soon and as all those present noted, the situation was already out of hand. The fire brigade in spite of fighting so hard against the unfortunate fire could not save anything. The total loss suffered by the Medical Entomology Section was estimated at LS. 351.000 m/ms. and that sustained by the Agriculture Research Division was to the tune of LS. 1,415.850. m ms.

Besides the material loss there was a great loss of the strains of mosquitoes that were burnt beyond repair since of the few eggs discovered in the breeding pans after the fire, only those of a local Sudanese strain of *Aedes aegypti* were found viable, the London and Trinidad strains having perished totally. With these few eggs efforts are being made to re-establish the colony. Very interesting experiments were in progress on *Anopheles pharoensis*, with a view to determining its susceptibility to insecticides and also on its laboratory bionomics. These ended abruptly. Efforts are once again being made to re-establish it.

On the request of the Medical Entomologist, the Director Medical Services has kindly sanctioned a sum of LS. 200.000 m/ms. with which building and repair work has already been set afoot.

Tabanidae

Collection of a few specimens of Tabanids made along with mosquitoes and sandflies were recognised as from the :

1. *Ancala africana* from Kaka, Melut.
2. *Tabanus taeniola* ,, ,,

Muscidae

A few specimens of *Glossina* sp. were also received.

Calliphoridae. The common species of the family *Chrysomya putoria* was also recognised in a collection received from Omdurman.

Trainees

Thirteen mosquioto-men were trained in the Section during the year under report.

Exhibits of insects of medical importance were sent to Gedaref.

Similar exhibits were sent for display on the occasion of the 17th November celebrations at Medani.

Senior Medical Students from the Kitchener School of Medicine, Khartoum visited the Section to whom insects of medical importance occurring in the Sudan were shown and the aetiology and control of different insect-borne diseases were explained. Insecticide testing methods were also demonstrated.

Also many land tenants visited the Section who were shown malaria and yellow fever mosquitoes and the control methods explained.

Appendix " A "

MOSQUITO SPECIES IDENTIFIED DURING THE PERIOD

Date of Collection	Locality	Stage	Identification	Remarks
9.11.61	El Magatta	L	<i>Anopheles gambiae</i>	Collected by the Section
11.11.61	Sasreiba	L	<i>A. gambiae</i>	
28.11.61	Wadi Halfa	L	<i>Culiseta longiareolata</i>	
18.12.61	Argeen	L	<i>Culex pipiens</i>	
19.12.61	Debeira canal scheme	L	<i>C. univittatus</i>	"
			<i>C. theileri</i>	
20.12.61	Agreen	L	<i>C. pipiens molestus</i>	"
21.12.61	Abusir	L	<i>C. univittatus</i>	"
23.12.61	Amka State River bank	L	<i>C. univittatus</i>	"
March 1962	Faras	L	<i>Anopheles multicolor</i>	Received from Wadi Halfa.
14. 1.62	Tendelti	L	<i>A. squamosus</i>	Collected by the Section.
11. 2.62	Akobo	A	<i>A. coustani</i>	"
	"	A	<i>A. funestus</i>	"
	"	A	<i>Culex poicilipes</i>	"
	"	A	<i>Anopheles gambiae</i>	"
	"	A	<i>Mansonia (Mansonioides) uniformis</i>	"
	"	A	<i>Anopheles pharoensis</i>	"
	"	A	<i>A. coustani</i>	"
	"	A	<i>Culex univittatus</i> var <i>neavei</i>	"
	"	A	<i>Anopheles wellcomei</i>	"
	"	L	<i>A. pharoensis</i>	"

Appendix " A " — (Contd.)

Date of Collection	Locality	Stage	Identification	Remarks
11. 2.62	Akobo		<i>Anopheles squamosus</i>	Collected by the Section
			<i>Aedomyia africana</i>	"
			<i>Culex poicilipes</i>	"
12. 9.61	Khor Oreir	A	<i>Anopheles pharoensis</i>	"
24. 9.61	Kodok	A	<i>A. gambiae</i>	"
25. 9.61	Kodok	A	<i>A. gambiae</i>	"
25. 9.61	Suba	A	<i>A. gambiae</i>	"
26. 9.61	Melut	A	<i>A. squamosus</i>	
			<i>A. wellcomei</i>	
28. 9.61	Yei	L	<i>Culex duttoni</i>	
29. 9.61	Renk	A	<i>Anopheles gambiae</i>	
			<i>A. nili</i>	
30. 9.61	Renk	A	<i>A. nili</i>	
2.10.61	Abu Khidra	A	<i>A. gambiae</i>	
			<i>A. pharoensis</i>	
3.10.61	Geiger	A	<i>A. wellcomei</i>	
4.10.61	Renk	A	<i>A. gambiae</i>	
9.10.61	Meridi	A	<i>A. gambiae</i>	
28.10.61	Yei	L	<i>Culex duttoni</i>	Barrel
29.10.61	Yei	A	<i>Anopheles gambiae</i>	Huts
4.11.61	Menduri	L	<i>Culex duttoni</i>	
13.11.61	Nzara	A	<i>Anopheles nili</i>	Huts
			<i>A. gambiae</i>	
13.11.61	Lui		<i>A. gambiae</i>	Huts
14.11.61	Menduri	L	<i>Culex duttoni</i>	
			<i>O. tigripes</i>	
18.11.61	Mvolo		<i>Anopheles gambiae</i>	
			<i>A. nili</i>	

Appendix " A " 2

COLLECTION RECEIVED FOR IDENTIFICATION

No.	Date of Collection	Locality	Species	Remarks
1	5. 7.61	Wadi Halfa	<i>Anopheles pharoensis</i>	
2	3. 8.61	Wad Medani	<i>Aedes unilineatus</i>	
3	9. 8.61	Wad Medani	<i>Aedes metallicus</i>	
4	28. 8.61	Wau	<i>Toxorhynchitis brevipalpis</i>	
5	4. 9.61	Wad Medani	<i>Aedes unilineatus</i>	
6	4. 9.61	Wad Medani	<i>Aedes aegypti</i>	
7	9. 9.61	Wad Medani	<i>Aedes metallicus</i>	
8	18. 9.61	Port Sudan	<i>Anopheles pharoensis</i>	
9	18. 9.61	Port Sudan	<i>Anopheles rhodesiensis</i>	
10	8.10.61	Wadi Halfa	<i>Anopheles pharoensis</i>	
11	28.11.61	Wadi Halfa	<i>Culiseta longiareolata</i>	
12	18. 3.62	Port Sudan	<i>Anopheles sp.</i>	
13	22. 3.62	Wadi Halfa	<i>Anopheles multicolor</i>	
14	29. 3.62	Wadi Halfa	<i>Choronomid larva</i>	

Appendix " A " 3

FROM AN OLD UNIDENTIFIED COLLECTION

Date of Collection	Locality	Stage	Identification	Remarks
7.10.33	Kosti	—	<i>Culex bitaenorrhynchus</i>	
17. 7.36	Medani	1	<i>Aedes (aedimorphus) arabiensis</i>	
27.10.36	Sennar	—	<i>Culex poicilipes</i>	
16. 4.35	Juba	11	<i>Aedes (Neomelanoconion) albothorax</i>	

Appendix " B "

COLLECTION OF MOSQUITOES BY THE SECTION

No.	Place	Approximate No. of Larvae or Adults	
1	El Showak	<i>Anopheles larvae</i>	250
2	Khashm El Girba ..	„ <i>adults</i>	150
3	„ „	„ <i>larvae all the stages</i>	1,000
4	„ „	<i>Culex larvae all the stages</i>	1,000
5	Sasreiba	<i>Anopheles larvae all the stages</i> ..	150
6	El Mukatta	<i>Anopheles larvae all the stages</i> ..	200
7	Umm Sheijira	„ <i>first stage</i>	100
8	Rabak	„ <i>pharoensis and Culicine adults</i>	250
9	Wad Medani	„ <i>pharoensis larvae</i>	10,846

Appendix "C"

No.	Date	Place	Species
1	7.11.61	Khashm El Girba ..	<i>Sergentomyia africana</i> <i>S. clydei latiterga</i>
2	8.11.61	Sasreiba	<i>S. africana</i> <i>S. clydei latiterga</i> <i>S. antennata</i>
3	9.11.61	"	<i>S. africana</i> <i>S. antennata</i> <i>S. clydei</i> <i>Phlebotomus bergeroti</i>
4	10.11.61	El Shajirab	<i>Sergentomyia antennata</i>
5	"	"	<i>S. squamipleuris var haseebi</i>
6	11.11.61	Showak	<i>S. antennata</i> <i>S. clydei latiterga</i> <i>S. squamipleuris</i> <i>S. squamipleuris haseebi</i>
7	21.11.61	Tozi	<i>S. squamipleuris</i> <i>S. africana</i> <i>S. antennata</i>
8	22.11.61	"	<i>S. clydei latiterga</i> <i>Phlebotomus darlingi</i> <i>P. langeroni orientalis</i>
9	23.11.61	"	<i>Sergentomyia antennata</i> <i>S. africana</i> <i>S. squamipleuris</i> <i>S. clydei latiterga</i>
10	24.11.61	"	<i>S. squamipleuris</i> <i>S. africana</i> <i>S. antennata</i>
11	26.11.61	Rabak	<i>S. clydei latiterga</i>

Appendix "D"

TOTAL NUMBER OF SPECIMENS OF DIFFERENT SPECIES IDENTIFIED DURING THE PERIOD

No.	Species	m.	—	f.	Total
1	<i>Phlebotomus bergeroti</i>	5	—	1	6
2	<i>P. darlingi</i>	0	—	1	1
3	<i>P. langeroni orientalis</i>	1	—	0	1

Appendix " D " (Contd.)

No.	Species	m. — f.	Total
4	<i>Sergentomyia africana</i>	80 — 161	241
5	<i>S. antennata</i>	49 — 122	171
6	<i>S. clydei latiterga</i>	110 — 93	203
7	<i>S. squamipleuris</i>	44 — 78	122
8	<i>S. squamipleuris haseebi</i>	2 — 1	3
		291 — 457	748

Name	Area	From	To	Purpose
Abdel Karim Eff. Abdulla and El Daw El Tahir	Wadi Halfa (all the area of Mosq. control)	16.10.61	28.10.61	Mosquitoes
Abdel Karim Eff. Abdulla and El Daw El Tahir	Gedarf and Khashm El Girba (Gedaref, Shuak, Meribeeaa, Makatta, Shikerab, Khashm El Girba, Jebel Meigel, Asubri and Sasreiba)	5.11.61	13.11.61	Sandflies
Abdel Karim Eff. Abdulla and El Daw El Tahir	White Nile (Kosti, Tendelti, Rabak, Jebelein, Malaah, and Showal)	22.11.61	29.11.61	Mosquitoes and Sandflies
Abdel Karim Eff. Abdulla and El Daw El Tahir	Wadi Halfa (Mosq. control area and round it + Argein)	18.12.61	24.12.61	Mosquitoes in relation to Malaria
Abdel Karim Eff. Abdulla and Ahmed Omer El Gadi	Malakal and Akobo (Round Malakal and Akobo, across Abyssinian border)	30. 1.62	9. 2.62	Mosquitoes in relation to Yellow Fever
Mr. Mohd. Qutubuddin, Abdel Karim Eff. Abdulla, Hassan Mohd. Ali and El Daw El Tahir	Abu Hamad (Dagash, Abu Hashim, Abu Tean, Mograti Island and Taqataa (Jun))	16. 2.62	28. 2.62	Simulium
Abdel Karim Eff. Abdulla and El Daw El Tahir	Many tours to Khartoum, Omdurman and Managil for Simulium, Flies and Mosquitoes	—	—	—
Ahmed Eff. A/Rahman Bereir and Ahmed Omer El Gadi	Khartoum, Karima and Merowi	17. 3.62	23. 3.62	Simulium
Abbas Eff. Ibrahim Mohd. and El Daw El Tahir	Port Sudan	16. 8.61	28. 8.61	Mosquitoes
Abbas Effl Ibrahim Mohd. and Ahmed Omer El Gadi	Upper Nile and Equatoria	12. 9.61	10.12.61	Mosquitoes
Hassan Mohd. Ali	Tozi	21.11.61	30.11.61	Sandflies

Appendix "O"

LIST OF PUBLICATIONS DURING THE YEAR BY MEMBERS OF
THE STAFF

Name and Initials of Author	Date of Publication	Title of Article	Title of Journal in which Published	Volume Number of Journal	Page No. of Journal
Mr. Mohamed Qutubuddin	26.3.1962	Notes on the Phlebotominae of the Sudan Republic with description of a new species and a sub-species	Annals and Magazine of Natural History	Vol. 46, Series 13	Pp. 593-611

CHEMICAL LABORATORIES

By

Abdel Hamid Ibrahim

1. Summary

The following table shows the number of samples received in different categories during the last two years :—

	1961/62	1960/61
Waters and Sewages	470	476
Foods	368	469
Drugs and Pharmaceuticals	34	63
Clinical Specimens	123	142
Toxicological Specimens	147	141
Forensic Specimens	91	41
Edible Oils, Seeds and Oil Cakes	2,469	1,881
Damaged Materials	401	245
Miscellaneous	190	219
TOTAL	4,293	3,677

Hence the year has shown a slight increase in the number of samples received. It is rather surprising that samples have decreased in all categories except with respect to edible oils, oilseeds and oilcakes.

The following table gives the number of samples submitted by the various Government Departments and others during the last two years :—

	1961/62	1960/61
Ministry of Health	745	706
Ministry of Agriculture	34	169
Ministry of Animal Resources	58	17
Ministry of Commerce, Industry and Supply	18	3
Ministry of Communications	36	36
Ministry of Works	20	83
Customs Department	30	31
Armed Forces	7	3
Sudan Police	69	53
Local Authorities	5	10
Khartoum University	20	4
Sudan Gezira Board	16	76
Other Government Establishments	21	16
Commercial Firms and Others	3,214	2,460
TOTAL	4,293	3,667

The above table shows a very interesting feature. About 17 per cent of all samples were submitted by the Ministry of Health, and 8 per cent by other Government Departments. The Commercial firms and private concerns and non-government establishments have acquired 75 per cent of our routine analytical services.

The fees for work done for non-Government establishments totalled LS. 5,525.191 m/ms. compared with LS. 4,939.753 m/ms. in 1960/61.

The fees from Government establishments besides the Ministry of Health totalled LS. 2,410.237 m/ms. in 1961/62 compared with LS. 2,212.955 m/ms. in 1960/61. There was no increase in the rates during the year.

The volume of work is expected to increase next year with the initiation of the new Pharmaceutical Section, especially if the new Pharmacy and Poisons Act comes into force.

2. Water and Sewages

Samples of water and sewages were received from the following sources :—

							1961 62	1960/61
Ministry of Health	..	..	..	..	..	..	171	122
Drilling Engineer	..	..	..	..	..	..	151	232
Sudan Gezira Board	..	..	..	..	..	..	13	48
Other Sources	..	..	..	..	..	..	135	74
TOTAL							470	476

The decrease is mainly in samples from the Drilling Engineer Department which have drilled fewer boreholes during the year.

3. Foods

The following samples were received duirng the year :

						1961/62	1960/61
Official Samples	..	..	..	..	..	255	266
Other Samples	..	..	..	..	..	113	203
TOTAL						368	469

There is a marked decrease in food samples which is an unfortunate trend. The Public Health Authorities are reluctant to take any serious steps with respect to legal prosecutions in food cases because of the absence of legal food standards.

The following table gives a summary of the different types of foods examined :-

DESCRIPTION								Number of Samples
Alcoholic Drinks	..	..	..	..	..	..	..	77
Beans	..	..	..	..	..	..	..	18
Cereals and Cereal Products	..	..	..	..	..	..	..	16
Cheese	..	..	..	..	..	..	..	4
Fruits, Canned	..	..	..	..	..	..	..	12
Honey and Syrups	..	..	..	..	..	..	..	3
Meat and Meat Products	..	..	..	..	..	..	..	22
Milk, Raw	..	..	..	..	..	..	..	91
Milk, Dried	..	..	..	..	..	..	..	11
Sardines	..	..	..	..	..	..	..	3
Squashes	..	..	..	..	..	..	..	10
Sugar, Refined	..	..	..	..	..	..	..	23
Tomato Puree and Sauce	..	..	..	..	..	..	..	9
Flour, Durra	..	..	..	..	..	..	..	9
Flour, Wheat	..	..	..	..	..	..	..	40
Rice	..	..	..	..	..	..	..	3
Other Foods	..	..	..	..	..	..	..	17
Total								368

4. Drugs and Pharmaceuticals

There is also a decrease in the number of samples in this category. The work in this category is confined only to suspected drugs in the medical stores. The Pharmaceutical Control Section, when it starts to function, will be required to survey all local and imported drugs.

5. Clinical Specimens

The clinical work still remains at a high level. It is interesting to note that five years ago no clinical work was being done in the Laboratories. Now, and with increased specialisation, the more complicated clinical chemical analysis is referred to these Laboratories.

6. Toxicological and Forensic Specimens

These totalled 198 specimens against 182 specimens in 1960/61. The work in this section is also increasing every year beyond the capacity of its staff.

7. Edible Oils, Seeds and Oil Cakes

The following samples were received during the year :—

							Number of Samples	
							1961/62	1960/61
Cottonseeds	..	..	..	..	..	..	61	131
Groundnuts	..	..	..	..	..	..	2,152	1,532
Sesame Seeds	..	..	..	..	..	..	66	23
Safflower	..	..	..	..	..	..	—	1
Castor Seeds	..	..	..	..	..	..	7	3
Edible Oils	..	..	..	..	..	..	84	69
Oil Cakes	..	..	..	..	..	..	99	122
TOTAL							2,469	1,881

The increase in samples in this category is enormous, and it is all from commercial firms. These samples are responsible for the income of these Laboratories.

8. Damaged Materials

There is a decrease in this category due to the better storage and transit facilities at Port Sudan.

9. Miscellaneous Samples

The following table gives details of the various types of samples received in this category.

								Number of Samples
Cigarettes	..	..	..	..	..	..	..	10
Gums	..	..	..	..	..	..	..	16
Minerals	..	..	..	..	..	..	..	8
Paints, Varnishes and Polishes				..	..	..	..	2
Pesticides	..	..	..	..	..	..	..	13
Soaps	..	..	..	..	..	..	..	20
Textiles	..	..	..	..	..	..	..	21
Miscellaneous	..	..	..	..	..	..	..	100
TOTAL								190

In this category samples are usually tested to see if they comply with various specifications.

CHAPTER IX

SCHOOL OF HYGIENE ANNUAL REPORT—1961/62

The School buildings lie next door to the Graphic Health Museum which is supervised by the Principal School of Hygiene.

The Museum is used by the students for demonstration and visual studies.

Staff

Principal.
Asst. Principal.
Public Health Officer.
Clerk.

Board of Studies

The Board of Studies, which consists of the A/Director (Public Health) as Chairman, Principal, School of Hygiene as Secretary, Chief Public Health Inspector and Asst. Principal, School of Hygiene as members, has held four meetings during the year to discuss the different aspects of the School policy.

Board of Examiners

The Royal Society of Health examination which is held in Khartoum, is conducted by Dr. Abdalla Omer Abu Shamma, Dr. Mansour Ali Haseeb, Sayed Abdel Rahman El Agib and Sayed Khalafalla Babiker with the Principal, School of Hygiene in attendance.

Sanitary Overseers

On selection and when required the candidates receive a six months training in the School of Hygiene, which includes an adequate number of demonstrations to supplement lectures. 11 have conducted their training during the year.

Public Health Officers

The basic education now required is that of the secondary standard.

The students take up a 3 years course at the end of which they must pass the R.S.H. examination before being awarded the qualifying certificate.

20 Students were taken this year 1961/62.

The Curriculum is Briefly as Follows :—

1st. Year

General Science, Building Science, Drawing and Construction, Levelling and Geometry, given at Khartoum Technical Institute.

2nd. Year

Entomology and Pests Control, Helminthology, Protozoology, Bacteriology, Water Supply and Disposal of Waste Matter.

3rd. Year

Food and Food Control, Meat Inspection, Milk Food Production and Manufacture, Housing, Urban and Rural Planning, Communicable Diseases, School Health, Prison Health, Quarantines, Airports and Seaports, Central Statistics, Sanitary Law, Relations between Councils and Public Health Staff, Notes on Training within Industries, Health Education.

The necessary demonstrations that supplement the lectures include visits to Water Works, Food Production Places, Schools, Prisons, and Factories, etc. Certain councils meetings are also attended. In addition to the demonstrations and practical training in Khartoum Province and its rural areas, each student spends part of his school vacation in another province besides Khartoum.

The School of Hygiene gives courses to Assistant Sanitary Overseers, Local Government Executive Officers, Health Visitors, Nurses and Medical Assistants when required.

CHAPTER X

THE GRAPHIC MUSEUM

The Graphic Health Museum has been closed since its demolition in February, 1962. The new building is going on.

CHAPTER XI

The following table shows the mean rainfall recorded in provincial meteorological stations :—

PROVINCE	No. of Stations	Mean Rainfall mms.	Highest Recorded Rainfall mms.	Lowest Recorded Rainfall mms.
Bahr El Ghazal	10	1093.9	1633.4	700.0
Blue Nile	21	468.9	1126.1	196.0
Darfur	14	584.1	1051.7	257.4
Equatoria	19	1667.4	2522.0	1041.0
Kassala	18	297.5	601.0	24.0
Khartoum	6	238.9	324.8	61.8
Kordofan	15	506.5	1014.0	285.6
Northern	9	49.9	139.5	—
Upper Nile	14	927.0	1887.0	454.0

TABLE I—1961/62

OUT-PATIENTS

NEW CASES BY DISEASES AND TOTAL ATTENDANCES

DISEASE	B. EL GHAZAL	BLUE NILE	DARFUR	EQUATORIA	KASSALA	KHARTOUM	KORDOFAN	NORTHERN	UPPER NILE	TOTAL	No.
Cholera ..	—	—	—	—	—	—	—	—	—	—	1
Plague ..	—	—	—	—	—	—	—	—	—	—	2
Snail Fox ..	—	8	—	—	—	—	—	—	—	8	3
Typhus ..	—	—	—	—	—	—	—	—	—	—	4
Yellow Fever ..	—	—	—	—	—	—	—	—	—	—	5
T.B. Pulmonary ..	740	1,086	304	441	1,252	1,660	891	652	1,742	8,768	6
T.B. Non-Pulmonary ..	318	1,307	76	172	1,187	686	476	242	829	5,293	7
Pneumonia ..	3,138	25,342	6,698	12,058	6,396	25,420	20,065	15,989	4,264	119,370	8
Influenza ..	253	12,112	4,160	12,636	19,478	19,262	6,594	2,356	5,496	82,347	9
Other Respiratory Diseases ..	38,017	641,471	304,929	245,208	265,364	465,756	325,032	257,745	96,841	2,640,363	10
Cerebro-Spinal Meningitis ..	267	324	2,095	1,329	33	635	1,081	21	117	5,902	11
Chicken Pox ..	1,512	7,781	2,275	8,465	3,149	6,085	2,774	384	2,959	35,384	12
Diphtheria ..	7	218	8	11	105	319	98	306	6	1,078	13
Encephalitis ..	—	—	—	2	—	—	—	—	—	—	14
Leishmania ..	1,454	5,436	—	4,514	3,157	6,948	2,253	809	938	28,131	15
Measles ..	403	16,232	2,762	1,281	1,983	11,370	6,378	923	1,579	42,911	16
Mumps ..	—	—	—	—	—	—	—	—	—	—	17
Polio-myelitis ..	1	83	13	22	11	107	3	3	1	244	17
Acute Rheumatism ..	8,906	5,715	8,001	2,198	1,842	13,986	8,734	15,317	5,604	70,303	18
Acute Whooping Cough ..	10	4,019	405	1,987	715	4,340	1,514	344	4,657	17,991	19
Dysentery ..	4,346	38,828	17,564	23,437	12,804	47,253	20,153	36,858	21,736	222,979	20
Enteric Fever ..	—	445	2	10	69	438	16	152	39	1,171	21
Gastro-enteritis of Children ..	2,062	70,057	6,551	5,962	9,025	99,405	20,850	32,732	19,648	266,292	22
Undulant Fever ..	—	9	—	1	—	5	—	—	2	18	23
Filariasis ..	85	3	53	2,797	10	23	6	—	7	2,984	24
Leishmaniasis ..	—	1,533	15	132	555	73	157	—	2,228	4,693	25
Malaria ..	28,140	100,356	89,847	234,673	87,533	31,098	141,838	14,875	43,127	771,487	26
Blackwater Fever ..	—	—	1	—	—	—	—	—	—	—	27
Oncocerciasis ..	1,594	—	19	2,049	—	—	—	7	—	3,669	28
Phlebotomus Fever ..	—	—	—	—	—	—	—	—	—	—	29
Relapsing Fever ..	—	—	—	—	—	—	—	—	—	—	30
Trypanosomiasis ..	1	—	—	81	—	3	—	—	1	86	31
Ancylostomiasis ..	2,738	21	478	9,008	106	110	96	91	265	12,913	32
Dracunculiasis ..	1,273	108	24	1,661	73	248	387	475	195	4,444	33
Schistosomiasis ..	529	16,716	12,822	4,529	407	8,205	8,494	5,330	186	57,218	34
Gonorrhoea ..	5,116	8,657	24,747	16,611	6,704	22,347	12,177	2,604	7,791	106,754	35
Soft Sore ..	79	134	942	231	456	840	360	25	25	3,067	36
Syphilis ..	7,485	7,524	60,756	9,788	6,797	10,182	25,618	5,372	19,611	153,133	37
Yaws ..	6,394	—	80	19,401	—	32	42	—	8,906	34,823	38
Anthrax ..	1	9	6	1	83	—	3	—	3	138	39
Hydrophobia ..	—	—	—	—	—	—	—	—	—	—	40
Human Leprosy ..	1	4	—	—	1	—	3	—	5	14	41
Madura Disease ..	1,037	146	—	593	17	118	164	82	62	2,230	42
Tetanus ..	25	371	22	2	46	2,566	65	187	—	3,265	43
Heat Stroke ..	—	101	5	40	18	6	28	10	60	293	44
Syndrome ..	—	—	—	—	—	—	—	—	—	—	45
Confinement ..	487	1,493	228	1,069	611	911	868	377	224	6,268	46
Gynaecological Diseases of Pregnancy and Parturition ..	1,573	32,066	11,281	3,199	7,469	23,563	46,578	13,582	1,240	140,551	47
Periperal Fever ..	477	12,171	866	1,607	1,362	16,396	9,258	7,295	35	49,467	48
Wounds and Injuries ..	3	95	9	7	112	103	215	698	6	1,248	49
Tropical Ulcer ..	64,580	653,482	235,770	303,497	234,564	384,998	292,719	233,359	103,302	2,506,271	50
Diabetes ..	4,714	1,152	4,951	17,895	802	3,631	4,763	1	3,772	41,681	51
Pellagra ..	12	559	36	55	327	2,143	569	944	2	4,647	52
Scurvy ..	1	—	31	—	1	4	21	—	203	261	53
Neoplasms, Malignant ..	86	909	423	642	462	243	2,018	103	147	4,798	54
Neoplasms, Non-Malignant ..	10	218	94	15	75	—	989	22	36	1,702	55
Neoplasms, Malignant ..	125	6,448	1,375	45	621	1,245	6,936	397	195	17,387	56
Trachoma ..	119	51,470	11,272	2,249	8,055	47,849	3,117	117,998	5,997	248,126	57
All other Eye diseases ..	18,653	542,360	136,935	88,891	167,489	297,196	284,298	235,630	49,407	1,820,859	58
Ear diseases ..	7,202	124,200	30,869	27,962	43,885	104,516	41,330	54,249	17,037	451,250	59
Skin diseases ..	17,096	70,014	37,972	79,813	26,498	77,027	64,511	31,838	21,217	425,986	60
Alimentary diseases ..	31,185	901,177	347,014	233,498	297,380	370,399	584,623	326,594	88,153	3,180,023	61
Circulatory diseases ..	2,649	123,600	14,830	2,695	25,681	51,105	33,584	74,295	11,727	340,166	62
Genito-Urinary Diseases ..	3,489	135,333	48,399	13,652	25,340	126,917	53,522	83,732	9,218	499,602	63
Organic Nervous diseases ..	15	4,071	677	24	820	6,975	4,016	9,000	15	25,613	64
Functional Nervous diseases ..	47	978	2	16	182	2,320	273	8,140	3	11,961	65
Fever of uncertain origin ..	24,809	12,732	35,342	24,019	15,746	177,350	10,673	27,531	62,056	390,258	66
All other conditions ..	62,575	550,523	133,401	200,520	260,719	470,852	212,883	143,686	94,522	2,129,681	67
Poisoning ..	—	459	7	—	376	—	—	868	—	1,725	68
Total News Cases ..	355,845	4,191,666	1,600,078	1,622,701	1,547,971	2,945,294	2,264,120	1,764,206	717,444	17,009,325	69
ATTENDANCES :											
MEN ..	363,567	2,079,855	730,545	1,210,299	1,217,448	1,718,773	1,362,772	923,662	450,648	10,057,569	70
WOMEN ..	301,707	1,776,841	616,681	733,157	287,610	1,640,171	1,105,422	1,128,463	321,412	7,911,464	71
CHILDREN ..	339,331	2,329,939	895,503	931,378	1,195,963	2,201,882	1,222,604	1,344,016	541,287	11,001,903	72
Total Attendances ..	1,004,605	6,186,635	2,242,729	2,874,834	2,701,021	5,560,826	3,690,798	3,396,141	1,313,347	28,970,936	73
Out-patients included above	—	—	—	—	—	8,780	—	—	82,480	93,260	74
Attendances included above	—	—	—	—	—	63,410	—	—	293,367	356,777	75

ADMISSIONS AND DEATHS BY DISEASES

No.	DISEASE	BAHR EL GHAZAL		BLUE NILE		DARFUR		EQUATORIA		KASSALA		KHARTOUM		KORDOFAN		NORTHERN		UPPER NILE		TOTAL	
		Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
1.	Cholera	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
2.	Plague	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2
3.	Small Pox	—	—	8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8	—	3
4.	Typhus	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4
5.	Yellow Fever	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5
6.	T.B. Pulmonary	292	22	898	76	226	30	274	12	615	40	995	106	376	84	293	13	492	16	4,461	399
7.	T.B. Non-Pulmonary	116	3	231	6	39	2	69	2	295	4	185	8	141	9	54	2	50	4	1,180	40
8.	Pneumonia	540	26	1,695	76	1,052	30	2,284	126	976	39	1,921	94	1,924	130	501	15	494	31	11,387	567
9.	Influenza	253	—	69	—	280	—	567	8	64	—	374	—	637	5	436	6	63	—	2,743	19
10.	Other Respiratory Diseases	463	16	2,290	27	609	7	925	21	1,056	30	2,076	34	1,473	38	1,062	24	299	9	10,253	206
11.	Cerebro-Spinal Meningitis	267	36	230	31	2,063	132	1,250	83	33	13	529	24	1,075	104	19	3	61	5	5,527	431
12.	Chicken Pox	1,512	3	302	—	1,049	—	1,408	3	226	—	118	1	423	—	121	—	360	5	5,519	12
13.	Diphtheria	7	1	196	20	6	—	9	3	102	12	298	10	98	16	299	19	23	2	1,038	83
14.	Encephalitis Lethargica	—	—	—	—	—	—	2	—	—	—	—	—	—	—	—	—	—	—	2	—
15.	Measles	1,454	—	90	—	881	51	501	63	197	5	264	10	215	1	72	—	37	—	3,711	130
16.	Mumps	403	1	398	—	1,120	—	153	—	63	—	53	—	356	—	168	—	61	—	2,775	1
17.	Poliomyelitis, Acute	1	—	64	3	11	—	12	1	11	4	107	1	2	—	3	—	1	—	212	9
18.	Rheumatism, Acute	169	3	248	4	122	1	111	2	149	—	58	—	402	—	201	—	160	2	1,620	12
19.	Whooping Cough	10	—	240	6	18	—	115	5	17	—	101	—	95	—	25	1	65	4	686	16
20.	Dysentery	233	12	848	15	713	20	559	41	644	21	953	9	619	54	339	3	1,072	59	5,980	234
21.	Enteric Fever	—	—	600	26	2	—	10	1	66	3	318	11	16	5	152	4	40	2	1,204	52
22.	Gastro-enteritis of Children	57	5	2,086	171	422	44	377	47	441	76	1,784	152	557	53	1,365	79	195	16	7,284	643
23.	Undulant Fever	—	—	13	—	—	—	1	1	1	—	3	—	—	—	—	—	4	—	22	1
24.	Filariasis	3	—	19	3	2	—	28	—	8	—	8	—	6	1	—	—	3	—	77	4
25.	Leishmaniasis	3	—	644	46	4	—	94	8	446	54	70	4	119	2	—	—	678	34	2,058	148
26.	Malaria	883	54	2,752	41	1,295	27	3,449	131	1,749	35	1,539	8	3,779	93	443	9	999	21	16,888	419
27.	Blackwater Fever	—	—	—	—	1	—	—	—	—	—	—	—	1	—	—	—	—	—	2	—
28.	Onchocerciasis	36	—	—	—	—	—	31	—	—	—	—	—	—	—	—	—	—	—	67	—
29.	Phlebotomus Fever	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
30.	Relapsing Fever	—	—	—	—	—	—	—	—	6	1	—	—	—	—	—	—	—	—	6	1
31.	Trypanosomiasis	—	—	—	—	—	—	81	3	—	—	3	—	—	—	—	—	—	—	84	3
32.	Ancylostomiasis	148	10	9	—	41	—	487	14	13	—	14	—	12	—	12	—	35	—	771	24
33.	Dracontiasis	46	—	9	—	1	—	136	—	8	—	5	—	22	—	—	—	127	—	354	—
34.	Schistosomiasis	35	2	424	14	25	1	221	6	45	1	308	4	95	1	224	—	23	—	1,400	29
35.	Gonorrhoea	60	—	42	1	111	1	306	1	18	—	10	—	106	—	45	1	81	1	779	5
36.	Soft Sore	—	—	5	—	9	—	43	—	—	—	—	—	4	1	—	—	—	—	61	1
37.	Syphilis	137	4	36	—	579	2	612	—	29	3	34	1	535	2	32	—	257	—	2,251	12
38.	Yaws	69	1	—	—	—	—	469	1	—	—	—	—	1	—	—	—	128	—	667	2
39.	Anthrax	—	—	10	1	7	—	1	—	20	—	—	—	2	—	—	—	3	—	43	1
40.	Hydrophobia, human	1	1	5	5	—	—	—	—	1	1	—	—	3	3	—	—	5	5	15	15
41.	Leprosy	1	—	19	1	—	—	3	—	15	—	15	—	3	—	—	—	55	1	115	2
42.	Madura Diseases	—	—	153	2	2	—	2	—	45	—	95	1	19	—	99	—	1	—	416	3
43.	Tetanus	25	9	86	25	6	5	39	18	17	3	6	1	28	15	10	3	56	14	273	93
44.	Heat Stroke Syndrome	—	—	1	—	1	—	7	—	—	—	1	—	3	—	—	—	—	—	14	—
45.	Confinements	506	11	1,386	19	233	8	837	10	381	6	911	5	868	28	282	5	200	2	5,604	94
46.	Gynaecological	182	2	1,713	8	679	5	264	4	1,224	3	2,341	5	1,452	3	1,673	16	347	2	9,875	48
47.	Diseases of Pregnancy and Parturition	56	4	2,839	4	134	1	377	4	653	1	2,136	4	229	—	421	1	34	—	6,879	19
48.	Puerperal Fever	3	1	137	3	9	—	7	1	112	3	102	3	73	—	474	—	6	—	923	14
49.	Wounds and Injuries	1,734	42	6,906	89	3,274	42	4,694	54	3,569	53	3,592	30	4,950	175	2,930	29	1,187	10	32,836	524
50.	Tropical Ulcer	279	2	19	—	92	—	968	5	8	—	1	—	29	—	—	—	459	3	1,855	11
51.	Diabetes	3	—	175	5	11	1	10	1	107	3	434	18	48	3	202	7	2	1	992	39
52.	Pellagra	3	1	—	—	2	1	—	—	1	—	1	—	—	—	—	—	27	1	34	3
53.	Scurvy	—	—	3	1	—	—	20	3	—	—	7	—	7	—	3	—	—	—	40	4
54.	Neoplasms, malignant	—	—	88	4	12	2	15	1	57	11	225	41	206	7	32	—	6	—	641	66
55.	Neoplasms, non-malignant	5	—	105	4	86	3	44	—	101	1	428	1	219	3	261	2	37	—	1,286	14
56.	Trachoma	—	—	29	—	7	—	17	—	1	—	17	—	20	—	28	—	20	—	139	—
57.	All other eye diseases	55	—	862	—	185	—	366	—	421	—	5,332	—	647	—	731	—	498	—	9,097	—
58.	Ear diseases	22	—	45	1	36	—	103	—	21	—	40	—	114	—	90	—	27	—	498	1
59.	Skin diseases	71	5	249	1	108	1	447	2	72	—	123	—	153	1	259	1	89	—	1,571	11
60.	Alimentary diseases	820	34	3,716	180	1,221	39	1,740	93	1,984	76	4,519	100	2,667	184	2,131	39	928	49	19,726	794
61.	Circulatory diseases	68	13	1,323	117	348	40	381	32	616	37	1,543	115	668	37	838	36	158	7	5,943	434
62.	Respiratory diseases	76	2	1,218	48	442	9	113	2	626	16	1,262	36	745	15	771	15	129	3	5,382	146
63.	Genital diseases	10	1	130	2	55	2	19	—	145	4	283	15	104	3	181	3	40	—	967	30
64.	Other diseases	31	1	80	4	2	—	18	1	34	3	22	—	19	—	233	7	10	—	449	16
65.	Of uncertain origin	218	5	1,950	77	518	8	61	9	891	29	544	23	198	13	952	16	401	4	5,733	184
66.	All other conditions	1,258	36	2,220	35	1,454	22	2,403	87	528	22	2,575	54	2,564	73	1,424	17	694	30	15,120	376
67.	Poisoning	1,365	115	125	2	7	—	—	—	62	2	15	—	—	—	71	2	—	—	1,645	123
Total		13,989	484	40,038	1,205	19,612	537	27,533	910	18,997	615	38,698	931	29,127	1,165	19,967	378	11,227	343	219,188	6,568
MISSIONS IN-PATIENTS AND DEATHS INCLUDED ABOVE		—	—	—	—	—	—	—	—	—	—	1,550	85	—	—	—	—	1,351	35	2,901	120

